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THE EVOLUTION OF UNITED STATES AND NATO TACTICAL
NUCLEAR DOCTRINE AND LIMITED NUCLEAR WAR
OPTIONS, 1949-1964

by

Alan Cary Maiorano

December 1983

Thesis Advisor:

Stephen Garrett

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The Evolution of United States and NATO Tactical
Nuclear Doctrine and Limited Nuclear War Options,
1949-1984

by

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Submitted in partial fulfillment of the
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ABSTRACT

The debate over nuclear weapons in Europe and their utility as part of NATO's forward defense strategy has persisted since the mid-1950s. Existing tactical nuclear employment doctrine and strategies are based on obsolete criteria and defense concepts established when the U.S. possessed superiority in nearly all nuclear categories. NATO has allowed its tactical nuclear doctrine and arsenal of battlefield nuclear weapons to deteriorate, choosing instead to rely on the American strategic nuclear umbrella for all but the most localized of conflicts.

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I. INTRODUCTION

Doctrinal inadequacy is just as often the cause of defeat, or of unnecessary reverses, as is technological backwardness. As often as not, conflicts are decided by which side is less obsolescent conceptually, or which side is able to learn more rapidly.

Colin Gray

The esoteric dispute over the respective significance of "capabilities and intentions" in the West betrays not a lack of insight into the nature of the problem but rather of the courage to face its consequences.

Lothar Ruehl¹

The debate over short- and intermediate-range nuclear weapons in Europe and their utility as part of NATO's forward defense strategy has persisted since the initial deployment of tactical nuclear weapons (TNW) in the mid-1950's. Through the years the debate has been conducted under such misleading rubrics as NATO's nuclear dilemma, nuclear myth and nuclear crisis. As early as 1953, Fortune magazine columnist Charles Murphy identified the problem of an inadequate U.S. nuclear employment doctrine and wrote:

In recent weeks there have been intimations that the [National Security Council] has under study a clear statement of the government's position on the employment of atomic weapons. It is about² time the government had a position on this subject.

That the debate has endured thirty years of investigation and speculation without satisfactory resolution reflects its obstinate relevancy to NATO's present defense posture. Rational discussion of the issue has been clouded by

politico-military compromise among allies, made worse by a consistent lack of strategic foresight.

Nowhere is this more evident than in NATO's tactical nuclear warfare posture. Existing TNW employment doctrine is based on obsolete criteria and outmoded concepts established in the late 1950's and early 1960's when the United States possessed a measurable superiority in nearly all nuclear categories. The strategic environment has long since changed and many, if not most, of the fundamental assumptions upon which TNW employment was predicated are no longer valid.

Adoption of the flexible response strategy by the U.S. in 1961 and NATO in 1967 explicitly created a niche for tactical nuclear weapons in the context of a controllable escalatory sequence in the event of a NATO-Warsaw Pact confrontation. With the conventional force structure generated by the shift to flexible response, however, the nuclear threshold was believed to be sufficiently high that the most likely nuclear employment scenario entailed large-scale "strategic" exchanges. Former Secretary of Defense and flexible response architect Robert McNamara explained the reasoning behind the move to flexible response to Los Angeles Times correspondent Robert Scheer in a spring 1982 interview.

...we moved from Dulles' strategy of massive retaliation to what was called "flexible response." That was, I think, a major advance because it substantially reduced the risk of nuclear war. And the level at which nuclear

weapons might be used under flexible response was raised so high that it was,³ in effect, the equivalent of mutual assured destruction.

Although the capability of United States and NATO forces to raise the nuclear threshold never reached anywhere near the level McNamara claimed, subsequent Administrations have labored under the (mis)perception that it had and planned accordingly. As a result, nuclear related planning, budgeting and strategy have been preoccupied with strategic (intercontinental) forces and strategic nuclear employment while tactical nuclear weaponry have been a nuclear pariah. Moreover, enthusiasm for the maintenance of a clear-cut distinction between conventional and nuclear conflict--the so-called firebreak--and the widespread conviction that limited nuclear employment would rapidly and inevitably escalate, has tended to discourage serious consideration and development of tactical nuclear employment policies and guidelines. The result is a NATO nuclear strategy for Western Europe which, if a low-level nuclear response is required or appropriate, is only marginally responsive to political preferences and even less responsive to the threat of Warsaw Pact soldiers, tanks and nuclear weapons.

With readily acknowledged inferiority in conventional forces vis-à-vis the Warsaw Pact, NATO has consciously chosen to place all its security chips on the side of deterrence, and ultimately on the American-based threat of assured Soviet destruction. To plan for a failure of

deterrence which calls for a limited nuclear employment is considered "thinking the unthinkable." Such respected American policymakers as Robert McNamara, George Kennan and McGeorge Bundy have recently called for the elimination of limited nuclear warplanning altogether, accompanied by a NATO movement toward a no-first nuclear use policy.

It seems much better that even the most responsible choice of even the most limited nuclear actions to prevent even the most imminent conventional disaster should be left out of authorized policy.

McNamara reiterated these views in a Fall 1983 Foreign Affairs article, stating that nuclear weapons serve no military purpose whatsoever except to deter one's opponent from using them.

The problem with McNamara's conclusion is twofold. In the first place, it avoids the speculative, but extremely relevant, "what if" question in the event pre-war deterrence breaks down and gives way to hostilities. By excluding limited tactical nuclear options from the response menu, NATO resigns itself to a misplaced reliance on an all or nothing nuclear posture. It places the nuclear initiative solely in Soviet hands and offers no viable riposte to limited, but militarily significant, Soviet nuclear attacks.

A second and related problem is that mere presence alone does not establish a deterrent as credible if the role of these weapons in a test of NATO defenses remains uncertain and undefined. The measure of credibility, or believability, assigned to NATO's nuclear deterrent is a function not only

of perceived (NATO) intentions but also capability, qualitative--the extent of viable employment options available--as well as quantitative. U.S. strategic nuclear forces are considered a credible deterrent largely because declaratory policy is supported by appropriate employment plans embodied in the Single Integrated Operational Plan (SIOP) and several Presidential Directives, most recently PD-59.

No such preconceived plans or directives exist for tactical nuclear weapons in Europe. The SIOP and PD-59 are sufficiently concise to enable versatile employment plans to be formulated yet vague enough to maintain a measure of Soviet uncertainty as to the exact U.S. response to aggression. In the absence of a coherent tactical nuclear doctrine and strategy, the spurious and ad-hoc employment of tactical nuclear weapons as a "last ditch" effort to resurrect conventional NATO defenses cannot hope to have a favorable military or political impact on the conflict. The dangers of escalation and collateral damage are particularly acute in the case of tactical nuclear weapons because of the large number of weapons readily available and their close proximity to the heavily populated East-West German border region.

Nuclear deterrent strategies have no doubt contributed to the absence of a serious NATO-Warsaw Pact confrontation for over 30 years. However, strategic nuclear parity between the superpowers has made extended deterrence--the

protection of Europe by a U.S. nuclear umbrella--infinitely more difficult, if not incredible. In the period of transition from Western nuclear superiority to parity, roughly 1960 to 1972, NATO failed to establish a satisfactory relationship between a policy of deterrence and a strategy of defense. While the NATO nuclear deterrent most likely influences Soviet intentions, this influence may be insufficient to forestall aggression which Soviet military doctrine explicitly reveals may include the limited use of nuclear weapons. For a variety of strategic, economic, political and emotional reasons discussed below, NATO has been unable to come to grips with the prospects of and requirements to defend against a limited nuclear war. Instead, it stubbornly adheres to a traditional dichotomy which declares conventional war defensible and nuclear war not only unwinnable but unplanable. For NATO, the implications of such a position are ominous. As Colin Gray has pointed out, "doctrinal inadequacy is just as often the cause of defeat, or of unnecessary reverses, as is technological backwardness."

Clearly, a NATO conventional force posture designed and equipped to defeat a Soviet assault presents a strong deterrent with a quality of resistance to theatre nuclear escalation not present in the flexible response strategy. Nevertheless, NATO has historically abandoned the extensive investment in conventional forces needed to attain a true defense capability in favor of cheaper, more "threatening"

nuclear weapons. Existing U.S. Army and NATO tactical nuclear doctrine, however, can only be described as obsolete, uncertain and inapplicable in most Euro-Soviet confrontation scenarios imaginable. In the absence of adequate conventional forces, a defense (warfighting) strategy that effectively weaves TNW into the flexible response strategy with a minimum risk of escalation is required.

This thesis traces the development, stagnation and decline of U.S. and NATO tactical nuclear doctrine and strategy from 1949 to 1984. It offers several prescriptive remedies to the tactical and theatre nuclear "dilemma" facing NATO today. Chapters II through VI each outline a phase in the tactical nuclear development process and describe the politico-military, economic, and social constraints which eventually inhibited practically all tactical nuclear thought within official Alliance circles. Chapter VII presents three alternative tactical nuclear postures for consideration in addition to what may be termed the "updated" flexible response strategy which presently governs NATO force employment. The merits of each posture are evaluated in the light of their ability to defeat a Soviet armored invasion at or near the German border, escalatory potential and collateral damage expectations. Chapter VIII, the conclusion, discusses the problems of NATO's conventional deterrent and dangers for NATO in presenting a nuclear deterrent where declaratory and action strategies are in fact, or perceived to be, disparate.

Throughout the text of the thesis a distinction is made between tactical and theatre nuclear employment. Although no official definition exists, an outgrowth of recent intermediate nuclear force (INF) arms control negotiations has been a 1000 kilometer breakpoint. Nuclear weapons with a range of less than 1000 kilometers are considered tactical while those with a range of 1000 kilometers or more are deemed theatre nuclear weapons. This somewhat arbitrary standard facilitates a workable framework for arms control but is less useful for analysis of employment doctrine and guidelines. Similarly, classification by warhead yield is of questionable utility for operational planning. Presently deployed nuclear systems range from subkiloton nuclear artillery to the selectable 60 to 400 kiloton yield of the Pershing 1. The selection of weapon system and yield to be employed is largely a function of the threat characteristics of the potential target, not its proximity to the battlefield.

For the purposes of this thesis, NATO tactical nuclear employment is defined as the employment of short-range, low-yield nuclear weapons approximately 100 kilometers either side of the point or areas of direct contact of opposing ground forces. Tactical nuclear employment is limited to the battlefield use of these weapons against strictly military targets, fixed or mobile. NATO theatre nuclear employment, on the other hand, is the employment of intermediate-range nuclear weapons (100-1000 kilometers) in

the theatre of operations extending from the immediate battlefield to the Soviet-East European borders. Theatre nuclear targets are therefore located solely within the East European Warsaw Pact countries and include ammunition depots, road and rail junctions, communication and transportation centers, main and secondary airfields and the like. The tactical nuclear arsenal is limited to nuclear artillery, atomic demolition mines (ADM) and short-range missiles like NATO's Lance and the French Pluton. Theatre nuclear weapons include the Pershing 1A and II, Ground Launch Cruise Missiles (GLCM) and land- and carrier-based aircraft delivered weapons.

Finally, in the course of my research, I have often found the bibliography in many of the sources reviewed more useful than the text itself, particularly when attempting to identify primary references, cross-check data or locate public or official statements. In an effort to aid subsequent researchers in the subject area and for the benefit of those seeking simply to enhance their knowledge of tactical nuclear thinking, an extensive bibliography is included encompassing tactical nuclear thought and strategy in the United States and NATO since 1946.

II. THE POSTWAR PLANNING CLIMATE, 1949-1953

Are the nations which are to receive military aid making a military effort comparable to that of the Soviet Union, taking into consideration their relative size and population, their economic strength, and the overall objectives of the European Recovery Program?

Representative John Davis Lodge

The military effort being made by the European nations... is the maximum effort feasible without sacrifice of economic recovery and the maintenance of a stable economic system.

Secretary of State Dean Acheson⁵

Economic recovery overshadowed all other requirements of the European post-World War II governments. Britain, once the second largest creditor nation in the world, had become its largest debtor. Its trade deficit ballooned as postwar exports dwindled to 60 percent of the prewar total. In Germany, industrial recovery stalled as the Allied occupation powers debated an equitable reparations agreement. France and the Soviet Union began to strip their respective zones of occupation of industrial material and equipment in an effort to assist their own faltering economies. U.S. aid poured into Europe, totaling over \$15.0 billion by 1947. Another \$23.0 billion followed in Marshall Plan aid from 1947 to 1952.

In spite of its economic difficulties, the Soviet Union was the only European power to maintain a substantial postwar military establishment. Soviet intransigence at the United Nations, Peace Treaty negotiations and hostilities

in Berlin, Eastern Europe, Iran and Greece raised fears in the West that a weak Europe would be a future target for communist aggression. Western Europe, absorbed in reconstruction, was clearly unable to mount a credible and militarily effective defense effort alone. U.S. Army strength had dropped from 89 divisions in 1945 to 10 under-equipped divisions in mid-1949. Less than three remained in Europe, and those with no coherent infrastructure. The Soviet Union, on the other hand, was believed to be maintaining 25 fully armed divisions in Central Europe and, overall, an estimated 140 of 175 divisions at battle strength. As a result, the "numerical ratio of Soviet infantry and armored troops to those of the West was at that time on the order of 5:1 or 6:1," far exceeding the 3:1 offense to defense ratio traditionally felt necessary for successful attack.⁶

The Truman Administration took great pains to explain to the U.S. Senate during the North Atlantic Treaty debate in early 1949 that European rearmament would be sufficiently limited to avoid impeding economic recovery. Similarly, the Europeans were assured military requirements would be oriented toward local defense, demand only modest defense expenditures, and remain subordinate to domestic welfare considerations. The original North Atlantic Treaty signatories viewed the new alliance as a guarantee of American protection and assistance while Europe rebuilt its cities and fragmented society. On both sides of the Atlantic the

backbone of that security guarantee was America's monopoly of "the absolute weapon."

Whether a case of strategic naiveté or simply political rhetoric, as a long-range plan this defense philosophy was less than prudent. It was expected the Soviets would develop the atomic bomb within 3-5 years, but NATO planners were satisfied with short term solutions. If defense estimates were correct, the combination of atomic weapons and delivery capability development would take the Soviets 7-10 years, placing any Soviet atomic threat near the end of the 1950's. Once bound by treaty, the United States' Strategic Air Command (SAC) would suffice to ward off hostile Soviet intentions. In the meantime, European recovery would enable the slow but deliberate regeneration of an adequate conventional defense establishment.

However, nuclear deterrent theory was yet to be fully developed and popularized. Bernard Brodie's early discussion of "The Absolute Weapon" remained an anomaly in the defense literature.⁷ The consequence of the deployment of Soviet atomic weapons comparable to those of the United States was understood by only a few and articulated by a handful of civilian strategists. The overwhelming imbalance between West European and Soviet forces on the central front led most to believe that the only viable alternative for the defense of Europe was the rapid response of SAC and its atomic weaponry. The era of the years-long conventional war

was viewed as over. For the Europeans, this was all the more reason to defray wasteful defense expenditures in favor of economic reconstruction while under the unchallenged American nuclear umbrella. President Truman explained to Congress that the proposed military assistance program to Western Europe

...will be limited to that which is necessary to help them create mobile defense forces. Our objective is to see to it that these nations are equipped, in the shortest possible time, with compact and effectively trained forces capable of maintaining internal order and resisting the initial phases of external aggression.

American military assistance was therefore targeted at creating a local defense capability, encouraging the belief among Europeans that any attempt to offset the Soviet Army's superiority would be futile.

The invasion of South Korea in June 1950 provided a momentary surge in NATO's concern for an adequate conventional defense of Europe. The impetus for rearmament which accompanied the Korean War proved short-lived, however, for three, mutually reinforcing reasons:

- (1) Western Europe was only beginning its economic recovery and, with limited funds, domestic economic requirements took precedence over all others.
- (2) The United States and Great Britain, in 1951 and 1952 respectively, elected governments which had promised and subsequently implemented reduced defense expenditures in favor of tighter budgets.
- (3) After a year of fighting in Korea, the conflict appeared to stalemate and no overt Soviet threat to Western Europe emerged.

Soon after the North Korean invasion the European governments announced plans to increase defense expenditures.

The caveat was that any significant increase would continue to rely on U.S. military assistance because internal economic matters still claimed the largest portion of available funds. The European allies demanded a greater troop contribution by the United States before moving ahead with their aggressive defense plans. However, with Europe on the road to recovery, the U.S. government tied increased financial support to European progress in defense. The Americans promised more troops only if similar European contributions were made. This, claimed the Europeans, required more military assistance. The rearmament "Catch-22" was ended when U.S. Congressional action to reduce funds in the Mutual Security Act of 1953 made it obvious such assistance was not forthcoming.

Contributing to the difficulty of sustaining a rearmament drive were the elections in the United States and Great Britain. The two most influential NATO governments changed administrations in the midst of the Korean War. Churchill and Eisenhower successfully campaigned on platforms which included reduced defense budgets, made possible by the perception that it was purely the fear of the "striking power of our atomic weapons" which had kept the Soviets at bay and would continue to do so in the foreseeable future. With the reduction of U.S. security assistance funds in FY1953, Congress informed the Europeans they could not expect increased aid for defense programs in the future.

Between FY1953 and FY1955 total U.S. military assistance dropped from \$3.95 billion to \$2.29 billion, a reduction of more than 40 percent over the three years.⁹

Similarly, the U.S. defense budget was reduced as promised. During the same three fiscal years (1953-1955), total major national security expenditures were reduced from \$50.36 billion to \$40.64 billion.¹⁰ It was Europe which most felt the defense budget pinch.

Such policies were hardly conducive to spurring conventional rearmament. While Congress continued to call for a greater independent European contribution to NATO, U.S. defense strategy explicitly identified atomic weapons as the mainstay of NATO's armament and conventional forces as essentially useless in all but the most limited and localized cases of aggression. The signal to Europe was clear. The United States had no intention of fighting another long ground war in Europe. The contradiction in U.S. defense policy and the American's desire for Europe to rearm left the European governments reluctant to rearm conventionally and ready to accede to the emerging philosophy of massive retaliation. This was particularly true in the period preceding German entry into NATO in May 1955. France was the only sizable land power left on the European continent, and her forces were spread between Europe, Indochina and subsequently Algeria.

Defense and rearmament programs begun before the Korean War were accelerated and "caused steep rises in the price of imported raw materials in relation to a slower rise in the price of manufactured exports and thereby created acute balance-of-payments deficits."¹¹ This served to reinforce Europe's predilection toward economic retrenchment, avoiding costly rearmament while relying on American nuclear striking power for security. This was not surprising considering that the U.S., by 1953, had amassed roughly 1,000 atomic warheads and more than 250 bombers.¹²

The failure of an overt Soviet threat to Europe to convincingly emerge during or immediately after the Korean War as anticipated removed what incentives remained for a substantial European participation in a conventional defense build-up. The long truce negotiations and cease-fires eased the initial urgency felt in Europe, and to a lesser extent the United States, to respond to potential Soviet aggression. Both the Soviet Union and the United States had visibly exercised restraint to ensure the conflict in Korea remained geographically limited. In March 1952, the Soviets demonstrated their "good faith and peaceful intentions" by calling for a four-power conference to discuss the unification of Germany through all-German elections. Finally, the death of Joseph Stalin in March 1953 was welcomed by all Europeans, raising hopes that the new Soviet leadership would be less tyrannical and aggressive and more cooperative in European peace ventures.

By 1954 the grandiose goals of the NATO Lisbon Conference, the European Defense Community, and West German rearmament--all of which had been given greater urgency as a result of the Korean War--were each dismissed with little or no implementation.¹³ In fact,

...certain European governments deliberately set their faces against the development of a strong local defense system in order, by so doing, not to limit the American obligation to defend them by the threat of nuclear retaliation.¹⁴

The American capacity for massive atomic retaliation required minimal European participation and provided an unquestionably effective shield against Soviet aggression. NSC 162/2, approved by President Eisenhower in October 1953, stated that "the major deterrent to aggression against Western Europe is the manifest determination of the United States to use its atomic capability and massive retaliatory striking power if the area is attacked." Accordingly, "the United States will consider nuclear weapons to be as available for use as other munitions."¹⁵

For the Europeans, the additional U.S.-European defense collaboration which accompanied the Korean War appeared adequate. In December 1950, an American General, Eisenhower, was confirmed as Supreme Allied Commander of Europe (SACEUR). Two months later the Supreme Headquarters Allied Powers Europe (SHAPE) was established. Simultaneously, the American troop contingent was raised by four divisions to total nearly six U.S. divisions on European soil. An American

commander and his troops were the link coupling the U.S. nuclear commitment to the defense of Europe.

In 1952 U.S. intelligence analysts estimated the Soviet nuclear arsenal at approximately 50 atomic bombs. Unknown to the Europeans was the fact that until 1951-1952 the U.S. arsenal was not much larger.¹⁶ The margin of safety assessed in 1949 as a 3-5 year Soviet nuclear development gap disappeared with the Soviet's August 1949 atomic explosion and new-found comfort was erroneously attributed to a 3-5 year Soviet nuclear delivery gap. This was believed more than sufficient time for the United States to increase its stockpile of nuclear weapons. Nevertheless, the recognition of Soviet atomic developments from 1949 to 1953 should have forced a fundamental reevaluation of NATO's massive retaliation strategy. Ironically, just such a recommendation was made in March 1950 in the final report of the House Armed Services Committee investigating the B-36 bomber program.

The Secretary of Defense should initiate a study in the National Security Council on the relationship to the national objectives of atomic warfare and present strategic planning for the use of atomic weapons...¹⁷

Little was accomplished toward this end, however, and any changes in U.S.-NATO nuclear strategy were more terminological than actual, effected under the guise of a shift from massive retaliation to assured destruction. The real value of the Soviet nuclear weapons, holding Western Europe a "nuclear hostage" to American "good behavior," was not

readily acknowledged until 1957, when Sputnik opened many civilian and military eyes.

The Soviet atomic threat was thus dismissed as long as the U.S. possessed, or was believed to possess, an overwhelming preponderance of nuclear force. NATO strategy, reflecting American military doctrine and the sudden requirement to construct a truly massive nuclear force, became preoccupied with numbers of bombs and numbers of bombers. The primary concern was not one of force employment but targeting requirements, something the allies were satisfied to leave to the United States for the time being. (Later, the British were to use the uncertainties of American targeting plans as a primary reason for constructing and maintaining an independent nuclear force.)

One of the products of this strategic planning failure was the tendency to rely on a self-assuring psychological advantage of numerical superiority, obviating the need for any serious employment doctrine beyond choice of targets. Reliance on the American nuclear deterrent provided a sound base for building public support in Europe for NATO and elicited little domestic criticism. Between 1949 and 1954 moderate defense expenditures by the Europeans were rewarded with maximum defense. However, by opting for the solution (massive retaliation) which offered the least politico-economic resistance, the groundwork was laid for several notions of deterrence and defense which were to become dangerously institutionalized over the next 7-10 years:

- (1) that European resources were inadequate to create a credible conventional defense against the Red Army of some 175 divisions;
- (2) that the Soviet Union would be deterred from aggression by the threat of urban/industrial destruction poised by American nuclear-equipped bombers;

And, as a result of (1) and (2):

- (3) that devising alternative conventional strategies was dangerous since it would only make calculations of an invasion easier for the Soviets and therefore increase the likelihood of that aggression;
- (4) that limited war in Europe was inconceivable since any serious Soviet aggression would inevitably escalate into a devastating nuclear exchange with Europe as the central battleground.

Each of the four "notions of deterrence and defense" contained, to some extent, a measure of fallacy. European resources were adequate to create a credible conventional defense against the Red Army, which did not, in actuality, possess 140 of 175 divisions at battle strength. Deterrence by the threat of urban/industrial destruction relied on the "correctness" of mirror-imaging Western cost-benefit calculations on the Soviet leadership. If alternate strategies did make Soviet calculations easier, they might not necessarily change the results for the better. Finally, the emerging Soviet deterrent force increased the likelihood that a conflict could be limited to a European battlefield by neutralizing the American strategic nuclear threat.

A. THE ORIGIN OF U.S. ARMY TACTICAL NUCLEAR DOCTRINE

Ironically, the Army was the only service branch pursuing a strategy which supported these latter conclusions. Traditionally the heart of the American defense effort,

the Army saw its previously central position being eclipsed by the Air Force and Navy, whose nuclear delivery capabilities made them focal points of U.S. strategic planning. The general acceptance of massive retaliation and Congressional reluctance to support a large ground force contingent in Europe relegated the Army to anchor position in the Department of Defense (DOD) hierarchy. A strategy of massive retaliation, predicated on a short atomic war, held no place for a large land army. The U.S. Army, in spite of its ground combat contribution in a limited war in Korea, struggled to maintain a modicum of influence among the services.

Until 1952 atomic weapons material was relatively scarce and devoted almost exclusively to research, development and production of large yield strategic weapons. But tests at Bikini Atoll in 1947 suggested new possibilities for the tactical application of low yield atomic weapons. For the Army, the potential of a tactical atomic weapon production line offered an answer to combat the Air Force's, and to a lesser extent the Navy's, increasingly dominant and influential position in defense strategy and policymaking.

As things stood, the Army was losing ground in the competition for defense resources, sorely needed to modernize its troops equipped with vintage WW II surplus and technology. From 1949 to 1954 Air Force expenditures increased ninefold, from less than \$2.0 billion to nearly \$16.0 billion. During the same period the Army budget increased by a factor of

less than 2.5.¹⁸ Furthermore, unlike the Air Force, the bulk of the Army's increase was absorbed by the Korean War.

Once the feasibility of low-yield, tactical atomic technology was accepted, Army strategists wasted no time in entering the "Great Debate." If the future was in atomic weaponry, to survive the Army would have to adapt.

...Army planners did not quite believe that the Air Force could win a nuclear war all by itself. Nor did they really see a future for the Army if they failed to find an important nuclear mission for it...They had to find a way of adapting nuclear weapons to ground warfare.¹⁹

While the search for a nuclear mission was fueled somewhat by the advent of low-yield weapon technology, it did have a solid foundation in traditional Army ground combat doctrine. The problem was not so much finding a mission as assessing the role of ground forces equipped to fight on an atomic battlefield without the benefit of experience. It was clear to the Army that no matter how decisive the high-yield weapons of the Strategic Air Command (SAC) were, the Air Force could not fulfill such critical tasks as post-attack territorial occupation and neutralization of enemy forces remaining after initial retaliation. Ground forces were still vital to the U.S. defense effort.

Virtually all Army officers agreed that ground forces should be equipped with tactical atomic weapons to facilitate an integrated conventional-atomic battlefield. There the agreement ended. Recommendations for tactics, command and control, employment and targeting were widely varied

and indicated the absence of any Army doctrinal foundation for atomic thought and strategy. Traditional issues of firepower, mobility and maneuver were suddenly given careful scrutiny under the theoretical conditions of an atomic battlefield.

Between 1945 and 1954 forty articles appeared in Military Review--a professional journal of the U.S. Army--addressing atomic/nuclear combat. The diversity of the articles and author's views reflected the lack of firm consensus among Army officers as to how ground forces, equipped with tactical atomic weapons, would be employed on the battlefield. Curiously, while concern over the Soviet atomic threat was more or less absent--at least until 1953--from the public debate on U.S. atomic strategy, it pervaded the unclassified Army literature.

The potential for very high losses from the enemy employment of a single atomic weapon on the battlefield led to a strong emphasis on maneuver and dispersion in the Army writings. Yet, even on these fundamental tactics two schools of thought emerged. In 1950, Lieutenant General Leslie Groves characterized the atomic battlefield as one of small, mobile forces, suggesting almost "guerilla-like" tactics for atomic weapon equipped units.

The threat of the atomic bomb may well reduce the size of units in combat...I do not see how large armies can be supported in combat. I anticipate the use of widely dispersed small forces...their equipment light--their supplies limited..²⁰

Likewise, General Matthew Ridgway noted that

...dispersion will be more pronounced than ever before and units will be more widely separated...Small unit actions will become more typical and decentralization of control more pronounced.²¹

Those views did not go unchallenged. A large body of the literature argued that extensive dispersion would merely weaken the main forces beyond a credible fighting capacity and undermine the effectiveness of the offensive. The key, according to these advocates, was concentration of force and local atomic superiority.

...dispersion on the level necessary to thwart the effects of atomic explosions is a sure way to defeat. It divides the force--men and material--required to win...dispersion in the²² offensive, as well as in the defensive, spells doom.

In early 1951 Army efforts to develop a tactical atomic weapon capability and build the requisite DOD support were given a temporary boost. Under the joint control of the Army, Navy and Air Force Project Vista was established at the California Institute of Technology to conduct a study of ground and air tactical warfare, focusing on the defense of Western Europe and applying lessons learned to date in Korea.

Initially the study was enthusiastically supported by all three services. When the study recommended "bringing the battle back to the battlefield," Air Force support quickly turned to opposition. According to Lieutenant General James Gavin,

...the early enthusiasm of the Air Force began to wane when it realized that increasing emphasis on tactical air support and tactical airlift would conflict with Air Force views on strategic air power...that an all-out air offensive was the only sound tactic and any diversion to defense was a waste.²³

The final project report, completed in February 1952, included a recommendation for the development of an Army tactical atomic capability. However, Pentagon defense thinking, dominated by the cost-effective strategy of massive retaliation, rejected the recommendation and the report was never officially approved by the individual services. Loath to give up its dominant position in defense, the Air Force had successfully opposed the Army's push for tactical atomic weapons. This type of interservice rivalry, particularly between the Air Force and Army, continued to obstruct and interfere with Army efforts to develop a coherent tactical atomic warfighting doctrine through the 1950s.

At the heart of the Army's early atomic thinking was the Army Command and General Staff College (CGSC) at Fort Leavenworth, Kansas and a study group there led by the school's Commandant, Lieutenant General Manton Eddy.²⁴ Evolving out of the CGSC study, in November 1951 the Department of the Army published its first guidance for the battlefield employment of atomic weapons, Field Manual (FM) 100-31, "Tactical Use of Atomic Weapons." Although published as a Field Manual--defined as the vehicle "to

promulgate military doctrine, tactics, and technique"²⁵-- it was characterized by uncertainty, the result of a lack of technical data and the Army's nebulous position in U.S. atomic strategy.

The development of the doctrine did not mask the divisions within the Army as to the utility of tactical atomic weapons on the battlefield.

Brigadier General Herbert B. Loper, Chief, Armed Forces Special Weapons Project...is reported to have told one member of Lieutenant General Eddy's study group, "Show me how to use this weapon in tactical roles if you can. It is not a tactical weapon."²⁶

Virtually no mention is made in the manual of combined service operations, perhaps indicative of the Army's lone support of a tactical nuclear weapon. In the introductory pages, FM 100-31 warned that

...Further tests are needed to determine exact tactical effects.

...Presently available data of atomic missile effects on tactical dispositions are inadequate. Acquisition of new data may require extensive revision of this manual.²⁷

Specifically, FM 100-31 recommended the widespread use of atomic missiles over a short period of time to disrupt attacking enemy formations. Following the advice of Generals Groves and Ridgway, the manual advocated greater dispersion of troop formations, advising commanders to avoid large concentrations of man and material which presented lucrative targets to enemy atomic fire. Major changes in basic offensive doctrine were not suggested. Rather the

offensive was still based on combining firepower and maneuver, only now atomic weapons were incorporated into the operation.

In spite of its shortcomings, FM 100-31 was a very positive step toward developing a warfighting doctrine which integrated conventional and atomic (nuclear) weapons on the battlefield. These weapons, according to the manual, did not change the Army's nine principles of war.²⁸ They were to be used carefully and coordinated with conventional firepower. Although the manual was distinctly defensive in orientation, offensive actions were considered the key to successful operations if attacked. Whenever possible, offensive maneuver was to follow atomic strikes "to destroy enemy forces disorganized by the explosions."

With the publication of FM 100-31 the Army followed, perhaps for the last time, the most rational sequence of strategy development: doctrine and employment guidelines preceded the field deployment of the first tactical atomic weapons. Simultaneously, officer training at the CGSC was expanded and revised so that "consideration on the tactical employment of atomic weapons was included in twenty-seven separate subjects."²⁹ Officers preparing to enter the field were at least moderately familiar with atomic weapons, their effects, and the Army's concept of employment. The Army had established an official position from which future debates could proceed: atomic weapons could, and most likely would, be used on the battlefield in conjunction with conventional weapons.

Unfortunately, it was the physical absence of the tactical atomic weapons from US/NATO inventories which allowed such rational doctrinal development. Other than in-house support, little attention was paid to FM 100-31. Political opposition was essentially non-existent and military considerations were allowed to dominate strategy formulation. Within the next three years, however, strong opposition did develop, as the weapons were deployed in Europe. Exercises Sagebrush and Carte Blanche, coupled with the highly publicized fallout data from thermonuclear tests in the Pacific, made obvious the tremendous devastation tactical weapons could cause. Both European leaders and U.S. politicians recognized the Army's declaratory doctrine was based on the premise of limited atomic war with Europe as the battlefield.

III. SHIELDS, SWORDS AND SOLDIERS, 1954-1960

The atomic bomb cannot be subdivided. This is inherent in the physics of the situation...There will be no shells from guns carrying atomic explosives, nor will they be carried by marine torpedoes or small rockets or in any other retail way. Atomic bombs will be used only against important targets to which it pays to devote a large effort...

Vannevar Bush³⁰

Vannevar Bush was wrong. In 1952 the Atomic Energy Commission requested \$3.0 billion for a tactical nuclear weapon (TNW) development program which would provide "a complete family of atomic weapons." Suddenly the policy outlined in NSC 162/2 equating conventional and nuclear weapons on the battlefield was given substance and atomic weapons were made available to the ground forces expected to meet the Soviet Army at the East-West German border. Between 1953 and 1958 U.S. forces in Europe were equipped with Honest John, Corporal, 8-inch howitzers, atomic demolition munitions and a few 280 mm atomic cannons. Despite the title "tactical," these weapons had yields ranging from subkiloton to 20 kiloton. The majority of the earlier weapons more closely approached the upper yield. Only the 8-inch howitzer and atomic demolition munitions had a subkiloton capability, with their maximum yields estimated at 2 and 15 kiloton respectively.³¹

The TNW arsenal in Europe remained small and grew slowly from initial deployment in 1953 until 1955. The rationale

for the deployment was, in part, the result of NATO's perceived need to counter the massive number of Soviet troops and, in part, a desire to provide the most economical--that is, inexpensive--defense. With Europe and the United States unwilling to fund a conventional force capable of opposing the Soviets, the alternative of TNW provided the means "to redress the numerical superiority of the conventional Soviet forces."³²

Initially, the strongest reactions to the new tactical nuclear employment policies were not European but in-house rivalries between the U.S. Army, Navy and Air Force. Both the Army and Navy challenged the Air Force's unilateral control over nuclear policy and weapons. The Air Force, fearing loss of its predominant influence, "became decidedly hostile to any notion that it might be necessary to find ways of limiting war by eliminating strategic bombing."³³ The controversy was resolved in true bureaucratic fashion with the Navy gaining carrier-based nuclear strike capability, the Army receiving battlefield TNW and creating smaller atomic-equipped units known as Pentomic divisions, and the Air Force retaining its dominant position in the strategic strike role. However, aside from the Army's reorganization into Pentomic divisions, there was little discernible change in the force structure or posture of NATO's forward forces. The fact that American strategy in Europe was being directed at the time by two Air Force

Generals, Lauris Norstad (SACEUR) and Nathan Twining (CJCS), certainly must have influenced this trend.

NATO officially incorporated the tactical nuclear weapons into its defense planning in December 1954. At the NATO Annual Review the North Atlantic Council declared TNW indispensable to the defense of Europe and plans based on TNW use were implemented in early 1955. Claims that the TNW deployment preceded, and therefore caused, NATO's failure to build an adequate conventional defense organization were frequently offered, but patently in error. Many Western defense analysts and military historians described the TNW deployment sequence as follows:

Tactical nuclear weapons were introduced, Western Europe did not want to raise troops, and after the introduction of tactical nuclear weapons, NATO dropped its troop³⁴ goals and began the process of doctrinal rationalization.

As described earlier, the NATO-Europe governments were reluctant to dispute American recommendations and apparently adopted the Lisbon goals with the full realization, before the TNW deployment, that they would never be implemented. In September 1952, only seven months after the Lisbon meeting, British Prime Minister Churchill suggested that concentration on nuclear weapons and strategic airpower would facilitate a considerably smaller ground force than the 96 divisions agreed upon at Lisbon. The next month France informed NATO that, in the absence of increased American security assistance, it would be unable to meet its Lisbon

pledge.³⁵ In 1954, under pressure from the European governments, the NATO Council indicated that the rearmament of the Alliance had ended as far as conventional weapons were concerned.³⁶ Thereafter, emphasis would be placed on qualitative improvements of those forces-in-being. NATO conventional force objectives were reduced to an official goal of 48 divisions, well before the bulk of tactical nuclear weapons were deployed in Europe after 1957.³⁷

Similarly, the implication that NATO had no TNW doctrine at the time of deployment was incorrect. FM 100-31, the Army's doctrinal manual, was published in 1951, again well before the delivery of atomic weapons to Europe. FM 100-31 provided guidance, albeit tentative, for atomic-equipped U.S. ground forces. NATO tactical nuclear guidelines were established in 1957, the same year as the first equipping and training of non-U.S. NATO forces with TNW and coincident with the plans to deploy the Thor and Jupiter IRBMs to Britain under bilateral (dual-key) control.³⁸ NATO guidance was much more hollow than the U.S. Army's, reflecting the European attitude that TNW was merely a supplement to massive retaliation forces and therefore required little more than passing attention.

As the tactical nuclear weapon made its way into the NATO inventory, however, there was a conscious effort to diminish the need for conventional forces, almost exclusively led by the Americans and the British. A 1953 report issued

by the British military chiefs, headed by the influential Chief of the Air Staff of the Royal Air Force Sir John Slessor, concluded that the danger of Soviet invasion had declined dramatically since 1950. The report advocated deep cuts in conventional forces in favor of a nuclear air strike strategy and the use of tactical nuclear weapons. According to the report,

If such bombs were used against invading ground troops, they would have deadly effect. There would be less need for a Western military Behemoth; troop strength could be considerably reduced. A proper British contingent might be as small as 50,000 men.

Slessor's recommendations became policy when the 1957 British White Paper on defense announced the decision to reduce UK conventional forces from 690,000 to 375,000 by 1962, equipping the remainder with "atomic rocket artillery." The British Army of the Rhine, an important contingent in NATO's front line in Germany, would be cut from 77,000 to 64,000 immediately with further reductions to follow.

Simultaneously, a similar strategic airpower theme was developing in the United States under the Eisenhower Administration's "New Look" policies. Concerned with the "economy of defense" as well as pure military considerations, President Eisenhower and Defense Secretary Charles Wilson led the drive toward a reduction of conventional manpower, rebuilding a reliable defense mobilization base, and increased reliance on the Air Force's Strategic Air Command.

Based on exaggerated intelligence estimates of the Soviet army, Eisenhower concluded that no acceptable defense expenditures could close the gap between conventional NATO and Soviet forces in Europe. In his memoirs, Eisenhower claims

...we knew that the Soviets maintained something in the neighborhood of 175 divisions active in Europe at all times. The United States had twenty divisions, only five of which were in Europe. Therefore, in view of the disparity in the strengths of the opposing ground forces, it seemed clear that only by the interposition of our nuclear weapons could we promptly stop a major Communist aggression in that area. Two more divisions or ten more divisions, on our side, would not make very much difference against this Soviet ground force.

But I was not pessimistic. My intention was firm: to launch the Strategic Air Command immediately upon trustworthy evidence of a general attack against the West.⁴⁰

The allies on the continent, however, were expected to meet their as of yet unattained conventional force goals of the 1954 NATO Council meeting. Contradictions and confusion in U.S. policy and NATO-Europe practices became readily apparent throughout 1955 and 1956. Two important events effectively undermined U.S. efforts to induce a European build-up of conventional forces once the TNW deployment had begun.

On 13 July 1956 one of the lead stories on the front page of the New York Times was "Radford Seeking 800,000 Man Cut."⁴¹ Admiral Arthur Radford, then Chairman of the Joint Chiefs of Staff, proposed reducing the U.S. Armed Forces by 800,000 men by 1960, with the bulk of the cut

targeted for the Army. Pentagon officials estimated the cuts would translate into the withdrawal of approximately 40,000 U.S. troops from overseas in the first year of implementation alone. Since any future war, according to Radford's proposal, would most likely be short and involve the use of nuclear weapons, Army forces assigned to NATO could be reduced to "small token forces that would wave the flag" but be equipped with tactical nuclear weapons.⁴²

These views were supported, not surprisingly, by Air Force Generals Twining and Norstad. Norstad claimed the presence of TNW made reductions of up to 2/3 of the Lisbon goals possible. Twining's remarks were even more dramatic, stating that the United States

...cannot afford to keep in our armed forces conventional forces for the old type of warfare plus those for atomic warfare. We have got to make up our minds that we have to go one way or the other.⁴³

American policies and public declarations gave the Europeans clear indication of which direction U.S. strategy was moving.

The response from Europe, particularly Bonn, was quick in coming and somewhat disgruntled. A very concerned Chancellor Adenauer sent General Adolf Heusinger, Chief of the German Armed Forces, to confer with key DOD officials. Unconvinced of the benefits of building a substantial conventional force while the Americans relied on strategic airpower and atomic weapons, the West German cabinet, two months

after Radford's proposals were made public, approved legislation providing a 12-month term of conscription rather than the initially proposed 18 months. The West Germans blamed the reduced term of service on the United States, explicitly referring to Radford's plan to cut U.S. forces. Although the Radford Plan was never implemented, the damage was already done. West Germany was no longer able to meet its previous obligation of 500,000 troops. In fact, in February 1957, West German Defense Minister Franz Josef Strauss stated that only 72,000 West Germans were in uniform.⁴⁴

The second event blunting the mid-1950s initiative for conventional rearmament was the announced troop reductions by the Soviet Union in August 1955 and May 1956, the latter conveniently complementing Radford's proposals to reduce U.S. armed forces. The Soviet cuts, 640,000 and 1,200,000 respectively, did not justify a sustained rearmament program by the Europeans. On the contrary, it appeared to the Europeans that a stable "imbalance of terror" was materializing between the nuclear armament of the West and the Red Army to the East. Until Sputnik in October 1957, U.S. nuclear superiority was felt to more than adequately offset the initial Soviet deployment of medium-range ballistic missiles. Additional conventional forces would only fuel a costly arms race which the Europeans were determined to avoid. Khrushchev's call for "peaceful coexistence" was seen as tangible evidence of the diminishing threat and the success of the deterrent strategy of massive retaliation.

Khrushchev's intentions in reducing the size of the Red Army had little to do with his rhetoric of peaceful coexistence. Aside from a very strong propaganda effect, the reductions were the result of internal political requirements and economic necessity and made possible by the growing "quality and quantity of our [Soviet] nuclear missile arsenal."⁴⁵ European leaders largely dismissed this "arsenal," preferring instead to rely on the Soviet leader's tension-reducing pronouncements.

The Soviet propaganda effort was especially successful in affecting the NATO government's perceptions of nuclear war and nuclear strategy. The nuclearization of Soviet forces in the mid-1950s naturally induced added caution and restraint into NATO's strategic planning. P.M.S. Blackett and Roger Hilsman attributed a nuclear capability to Soviet ground forces as early as 1954, closely approximating Thomas Wolfe's finding that Soviet MRBMs went into series production around 1955.⁴⁶ Until 1958-1959, with the deployment of the SS-4/5, the FROG (free rocket over ground) and Scud short-range missiles made up the bulk of the Soviet nuclear missile inventory. Quantitative estimates, however, varied widely and were inconclusive, ranging from 75 to 300 deployed missiles by 1956. Whether the actual arsenal was less than 75 or more than 300 missiles was not an especially important point. Americans and West Europeans alike believed the Soviet arsenal was substantial enough to wreck havoc in Europe and reacted accordingly.

Thus, by 1957, West Europeans felt themselves under the same cloud of nuclear destruction which NATO had introduced to the Soviets in 1953-1954. European and American defense planners felt that the combination of low accuracy and high-yield which characterized the Soviet MRBM force precluded any rational conception of limited nuclear war. Khrushchev was not slow to capitalize on this Western fear and his frequent claims that any nuclear war would inevitably lead to a massive rocket exchange were reinforced by the writings in Soviet military journals.

It is quite clear that the first attempt to use this 'tactical' weapon would lead to the mass use of atomic and hydrogen bombs.

...the radius of [explosive effects of] nuclear weapons and the nature of contemporary military objectives is such that it completely excludes the possibility of their employment only on a 'tactical' scale.⁴⁸

As the non-US/NATO forces were equipped with TNW, Soviet propaganda was stepped-up. In April 1957, a Soviet note to the West German government warned against the Bundeswehr participating in any NATO TNW arrangements. The note reminded the Germans of their vulnerability to Soviet missile attacks and, in the event of a nuclear war,

One can easily see that Western Germany, whose territory would become the target of the most powerful and concentrated blows of these weapons, would be destroyed, would become one big cemetery.⁴⁹

The success of the propaganda effort cannot be over-estimated. The Soviets were using powerful words, backed

by a small but credible nuclear missile force. If the Soviets were expressing their strategic doctrine accurately, then a failure of deterrence meant tremendous devastation to the Europeans. If the localized use of TNW resulted in an immediate Soviet missile retaliation, then the strategy for TNW employment was faulty. Khrushchev's satisfaction with the Soviet propaganda and the fear of limited nuclear war it instilled in the European governments prompted him to write:

In this regard I must give our departed enemy Adenauer credit for his sober-mindedness..."I don't know what you're talking about," [Adenauer] would say. "If a third world war is unleashed, West Germany will be the first country to perish." I was pleased to hear this. ...For him to be making public statements like that was a great achievement on our part. Not only were we keeping our number one enemy in line, but Adenauer⁵⁰ was helping us to keep our other enemies in line, too.

In spite of the growth of the Soviet nuclear counter-deterrent, both in intermediate- and intercontinental-range missiles, U.S. nuclear superiority continued to be wholly accepted as the only effective guarantee of European security. The strategy of massive retaliation/assured destruction continued to fill NATO's deterrent needs. It did not, as the NATO members were well aware and ready to accept, satisfy defense needs. In effect, the Americans and the European allies consciously chose a strategy which precluded any limited war options, conventional or nuclear. "Local attacks," an undefined form of "sub-limited" war, was the only form of aggression to which NATO's conventional forces would respond. While this type of Soviet aggression

was viewed as unlikely, it was the only form of aggression to which NATO was prepared to respond conventionally. Testimony by Secretary of Defense McElroy before the Senate Foreign Relations Committee in 1959 illustrated that there was a conceptual convergence of limited and local wars which extended beyond mere rhetoric and into NATO strategic thinking and planning.

McElroy: ...we must not degrade our ability to respond to a general war possibility by any response that we make to the limited war situation.

Fulbright: Does that mean we will not respond to limited war situations?

McElroy: No, it does not.

Fulbright: I am not clear what it does mean.

McElroy: It means that we cannot retain our capability to deter general war while we are responding to a limited war threat...

Fulbright: But if there is a limited war, what happens?

McElroy: ...It depends entirely on how big it gets.

Fulbright: It seems to me that if we are not to just up and respond to a local war, we must maintain an adequate ground force, Army, infantry. Do you think we are retaining adequate ground forces for local attacks?

McElroy: I do indeed...We think the ground forces we have in the Army and in the Marines are adequate to deal with limited war situations we visualize.⁵¹

It was obvious from McElroy's testimony that, by his definition, limited war closely approximated Fulbright's "local attacks." It was equally obvious that, when the definition was applied to the Soviets, aggression in Central or Western Europe could never be categorized as limited. The Secretary's remarks mirrored US DOD and NATO strategic

thinking: minor "border skirmishes" would be combated with conventional forces but nuclear weapons would continue to be relied upon to deter major aggression. Between the two extremes little effort was devoted to either building adequate conventional forces or incorporating the TNW into NATO war plans based upon conflict limitation.

No major NATO program better exemplified these notions of deterrence over defense than the Thor/Jupiter intermediate-range ballistic missile (IRBM) deployment. On the heels of the "missile gap" fears generated by the Soviet's Sputnik launch in October 1957, the NATO Council resolved to station the American IRBMs in Europe. The technological achievement demonstrated by Sputnik was quickly applied to the Soviet medium and intermediate range missiles and suddenly the protection provided by U.S. nuclear-capable bombers was not considered sufficiently responsive. Thor and Jupiter were deployed as an interim measure to "fill the gap" until U.S. land-based intercontinental ballistic missiles (ICBM) went into production.

Virtually no attention was given to the military utility of the missiles, probably because there was so little.⁵² Their provocative nature and vulnerability made them an unattractive addition to the massive retaliation arsenal. As ~~Albert~~ Wohlstetter explained in his classic article "The Delicate Balance of Terror":

The inaccuracy of an IRBM requires high-yield warheads, and such a combination of inaccuracy and high-yield, while quite appropriate and adequate against unprotected targets in a general war, would scarcely come within even the most⁵³ lax, in fact reckless, definition of limited war.

Without question the primary motive behind the Thor/Jupiter deployment was "to restore the diminished confidence of European governments in the efficacy of the strategy of massive retaliation."⁵⁴ As the "premier" nuclear weapons in the US/NATO arsenal at the time, Thor and Jupiter set the tone for forward-deployed nuclear weapon strategy; they were weapons of retaliation, not useful military application.

The aversion to limited war and limited war strategies was not a peculiarly European trait. While US DOD spokesmen and defense analysts tended to blame the Europeans for failing to adequately rearm for limited war contingencies, they ignored the importance and influence upon European strategic thinking of statements made by prominent American civilian and military officials in, or associated with, the NATO organization. As SACEUR, General Norstad continually espoused the need for a substantial "shield" of forward-deployed conventional forces.

If we concentrate only on weapons and forces for general war, we deny to ourselves the capacity to dispose of lesser situations, and could suggest an opportunity for limited aggressions...we must be able to respond to less than ultimate incidents with decisive, but less than ultimate, means.⁵⁵

However, Norstad went on to explain.

By this I am not suggesting that limited wars are possible along this sensitive frontier of NATO. It would be very unlikely,⁵⁶ I feel, that a serious incident could remain limited.

Norstad made it quite clear that he did not consider warfighting the most important function of the shield forces but rather a critical component to "to complete the deterrent."⁵⁷ Advocating official U.S. policy, Norstad's comments indicated not only that U.S. forces were neither in position for nor preparing to conduct any form of limited war on European soil, but also that any breach of NATO borders beyond a "border skirmish" could only be countered with the employment of strategic nuclear weapons.

The attractions of a "deterrence or total war" strategy were obvious. It was inexpensive, requiring relatively small defense expenditures in comparison to the deterrent obtained. To a large degree, it reduced the prospects of Europe becoming a battleground, conventional or nuclear. In the event deterrence failed, the limited strategic arsenals of the superpowers might result in a nuclear exchange over the heads of the Europeans. Finally, only minimal conventional forces need be forward-deployed along the East-West German border in order to provide what Raymond Aron aptly called the "casus belli atomici" for U.S. nuclear involvement.⁵⁸ America's superiority in warheads and delivery capability made this a feasible, if not desirable, strategy. The phrases "trip-wire" and "plate-glass window" were

popular descriptions applied to those forward conventional forces which embodied this NATO philosophy.

The strategy was strongly encouraged by the French, whose support was founded less on strategic implications than political motivation. The emphasis on small conventional forces acted to satisfy French fears of a rejuvenated German army. In addition, NATO's inclination toward a powerful nuclear deterrent strengthened the argument for an independent nuclear force put forth by influential French military strategists such as Ailleret, Gallois and others. Since the employment of tactical nuclear weapons was associated almost exclusively with German soil, a Soviet breakthrough to French borders left the French relying on the response of U.S. strategic bombers, a response which became increasingly uncertain with the growth of Soviet nuclear forces. For the French, the most logical, and effective, solution was to create their own independent nuclear retaliation force.

By 1958 the primacy of deterrence--in the form of massive retaliation--over defense was institutionalized among the Europeans. No war, conventional or nuclear, would spare Europe the destruction it had seen in WWI and WWII. Phrases describing nuclear war as "laden with doom," "double suicide," "likened to two scorpions in a bottle," and "power to destroy all life on earth" were commonplace in professional journals as well as newspapers. Tactical nuclear

weapons would only magnify that damage. A strategy of defense seemed to assure the destruction of Europe. Only deterrence was feasible. There was little value in programming TNW into an integrated defense strategy. The weapons served only to enhance deterrence and negate the Soviet potential for employing similar systems without fear of a response in kind. Along with American troops, tactical nuclear weapons were considered a crucial link coupling the defense of Europe with that of the United States.

The adverse effects of adopting a purely deterrent strategy were less obvious than the attractions. They would become evident, although not totally accepted, only after the U.S. shift to flexible response in 1961. Massive retaliation left no room for a nuclear weapon considered ineffectual in an environment which relied on a tremendous U.S. nuclear strike as soon as the "plate-glass window" was broken. Even with TNW, the forces present on the central front were inadequate to halt a serious Soviet invasion. Helmut Schmidt described the European view when he stated that in an East-West confrontation, NATO.

...would have prevailed if--and the 'if' is an important one--the West had in fact immediately brought the whole of its nuclear striking power to bear on the Soviet Union.⁵⁹

Aggravating the presence of TNW in Europe was the problem of control. With the exception of the Thor missile squadrons deployed to England in 1959, all the weapons were under

"single-key" American control, effectively removing the European leadership from the decision-making process involving their use, especially in the event of surprise attack. Leery to debate with the Americans concerning the control of the tactical nuclear forces and seeking to maintain a modicum of autonomy in security decisions, the two most powerful European allies proceeded with their own nuclear weapons programs. For Great Britain, followed by France, nuclear independence came not only as a strategic imperative, but also one of prestige.

The preeminent danger of a tactical nuclear strategy did not go unnoticed by its advocates. It meant crossing the precarious, but well-defined firebreak between conventional and nuclear war. Few doubted that the control of escalation would be more difficult, although not impossible, once the nuclear threshold was behind rather than ahead of continued hostilities. Nevertheless, Generals Bradley and Gavin supported the idea of an integrated battlefield using conventional and tactical nuclear weapons. Both reiterated the requirement for increased conventional forces to compensate for the higher and more rapid attrition rates expected on a nuclear battlefield. Greater mobility and dispersion were deemed essential. The importance of formidable ground forces, quantitatively as well as qualitatively, was not to be underestimated according to the Generals. Without them, prospects for conflict limitation and

escalation control were severely handicapped. Between 1957 and 1961 several seminal works appeared in print supporting the General's conclusions: Limited War: The Challenge to American Strategy; Nuclear Weapons and Foreign Policy; War and Peace in the Space Age; and perhaps the most influential, The Uncertain Trumpet.⁶⁰

At the close of the 1950s, nearly seven years after the introduction of tactical nuclear weapons to Europe, no coherent strategy had been developed for the limited, battlefield use of these weapons. Through the entire range of tactical nuclear systems the armed services had "never been given a clear-cut statement allowing them to plan with complete confidence on the use or limitation of use of atomic weapons."⁶¹ By 1960, Air Force General Twining claimed "the JCS had tried and failed to improve coordination in nuclear planning."⁶² What Twining and others failed to realize was that the real stumbling block was the divergent conceptions of deterrence and defense between the U.S. Army and other advocates of limited nuclear strategies on the one hand and the governments of the United States and its European allies on the other. This divergence was remedied only in rhetoric with NATO's adoption of flexible response in 1967 and would continue to plague US/NATO defense planning into the 1980s.

A. THE RISE AND DECLINE OF U.S. ARMY TACTICAL NUCLEAR DOCTRINE

The in-government opposition to the tactical employment of nuclear weapons was not as prevalent in the early years of the Eisenhower Administration. With his election to the Presidency, the Army had continued to refine its early nuclear battlefield proposals in the favorable climate of the "New Look" policies. In the first year after Eisenhower's election, the "New Look" was firmly implanted in the U.S. armed services, although each service had reached somewhat different conclusions as to how atomic/nuclear weapons would be employed in support of U.S. military strategy. The Air Force maintained its traditional post-WW II posture of relying on strategic bombing via long-range airpower. The Army, on the other hand, viewed the "New Look" as a movement toward a more diversified nuclear arsenal which would allow the application of a more appropriate amount of force against a variety of targets.

Limited nuclear materials had previously restricted weapon production to high-yield bombs for strategic targets. With the development of thermonuclear technology, requiring less nuclear material, and advances in small weapon design, this restriction gave way in 1953-1954 to an era of "nuclear plenty," enabling the Army to move from the theoretical weapons described in FM 100-31 to forward-deployed systems. The result, according to former Assistant Secretary of

Defense Alain Enthoven, was "a race to equip everybody--even the infantry--with nuclear weapons."⁶³

The opening of production lines for tactical nuclear weapons such as Honest John and Little John short-range missiles and the 8-inch howitzer shall, fostered an even greater internal consistency within the Army on tactical nuclear doctrine than FM 100-31 alone had in 1951. No longer were questions of use versus non-use applicable. With the weapons entering the field at an increasingly rapid rate, the unresolved "how to's" of atomic combat were brought to the foreground. Questions of dispersion, mobility and firepower were essentially resolved by Army strategists at the Command and General Staff College (CGSC).

Between 1954-1956 the CGSC conducted three studies for the purpose of upgrading tactical nuclear doctrine. The instruction establishing the guidelines for the first study (1954), known as the Easterbrook Committee, stated that

It is to be considered that nuclear weapons are now a part of the battlefield as much as automatic weapons and tactical airpower.

...it is desired to eliminate the existing inconsistency between "atomic" and "nonatomic" units of instruction...in that atomic considerations are not stressed except in selected atomic units of instruction or atomic sections of units.⁶⁴

The remaining two studies, the Educational Survey Commission (1956) and the Clow Committee (1956), reached similar, if not identical, conclusions. In August 1956 the Commander, U.S. Continental Army Command (CONARC) issued

a directive that ordered all combat arms branch schools "to depict atomic warfare as the typical and to treat nonatomic warfare as a modification of the typical."⁶⁵

The increased emphasis on tactical atomic warfare brought on by the CONARC directive was reflected in the evolution of the "tactical problems" taught at the CGSC in the 1950s. In 1952 the corps conducted attacks in possession of 6 atomic weapons with yields of 15-60 kilotons. In 1955, the number of weapons was increased from 6 to 50. By 1957 the corps commander was allocated 78 nuclear weapons ranging in yield from 1 to 500 kilotons.⁶⁶

The operational outcome of the Army's aggressive approach to tactical nuclear tactics and training was the reorganization, beginning in early 1956, of the ground forces under the Pentomic concept. The new structure created smaller, self-contained and nuclear-equipped divisions capable of independent action over a significantly larger battlefield area than their predecessors. The on-scene commander was to locate the enemy and "destroy him by directing atomic fire upon him."⁶⁷ The fundamental tenets of the Pentomic division directed the commander to concentrate forces only briefly for attack, disperse widely for defense and maneuver often to prevent accurate targeting of his forces.

The Pentomic division was to be prepared to fight without the support of other corps. Command and control,

tenuous at best on an atomic battlefield, was to reside at the lowest level possible.

The small unit leaders...will be called upon to a greater degree than ever before⁶⁸ to make tactical decisions upon the battlefield.

The new division structure was envisioned as capable of sustained fighting without reinforcements and with organic nuclear artillery (8-inch howitzer) and short-range missiles (Honest John).

By 1959 all U.S. divisions stationed in Europe had been reorganized under the Pentomic structure. During the period of change (1956-59) NATO force goals were revised downward for the second time since the Lisbon Conference in 1952. NATO officials announced a new goal of 30 nuclear (Pentomic-type) combat-ready divisions to face the estimated 140 active Soviet divisions. The decision to reduce, however, was not made in response to the military-strategic implications of the shift to 30 "Pentomic" divisions. Most analysts and senior military men by then generally agreed that a tactical nuclear strategy would require more, not less, manpower. Rather, budgetary pressures on defense from the Eisenhower administration in the United States and the NATO governments in Europe prompted the acceptance of the convenient cost reductions provided by the move to the Pentomic concept and its associated force level deflation.

In Europe, virtually no progress had been made toward the 1954 revised goals of 48 combat-ready divisions. The

Europeans continually claimed that 48 divisions were too many soldiers and too much expense to apply toward a strategy which called for the rapid and massive use of nuclear weapons as a response to aggression.

In the United States, in February 1957, the Eisenhower administration announced a \$38 billion defense budget for FY 1958, which would require a 10 percent reduction in military personnel by each of the services. Five months later, in July, Secretary of Defense Wilson presented a long-range defense program to the National Security Council (NSC) which specified additional manpower reductions in favor of retaliatory nuclear forces. According to General Maxwell Taylor, present at the July NSC meeting, the program

...covered the period 1959 to 1961, and undertook to hold the annual defense budget at approximately \$38 billion by reducing military manpower to compensate for the rising cost of military equipment. Specifically, the overall military manpower was to decrease from 2,500,000 men in 1959 to 2,200,000 men in 1961. The decline in strength was to be particularly sharp in the Army, which would drop from 900,000 to 700,000 men and ⁶⁹from 15 to 11 divisions in the three-year period.

The launch of Sputnik in October and the influence of an Air Force General as Chairman-JCS reinforced the concepts put forth by Wilson. While the impact of actual implementation of the program was less serious than initially thought and eventually reversed by the Kennedy administration, the impact on Army strategic planning was quite strong. Pentomic divisions were already "cut to the bone" with respect to manpower and further reductions would render them marginally

effective. Logistics support, already made difficult by dispersion and maneuver, would be even more so with fewer personnel devoted to support functions. The Army's potential problems, however, were dismissed by the Secretary of Defense and Chairman-JCS because only the Army was preparing for limited war, and limited war was not to be fought in Europe. From the Army's viewpoint, underlying Wilson's long-range plan "there was no consideration of the fundamental soundness of the background strategy of the Defense program."⁷⁰

Ironically, the entire series of events between 1956 and 1959--the shift to Pentomic divisions, Wilson's defense proposals, and the NATO force reductions--occurred at a time when the Soviet threat was still estimated at 140 active divisions and a "total force of 400 Soviet divisions [that] could be mobilized in thirty days."⁷¹ NATO resistance without recourse to nuclear weapons seemed impossible.

In an atmosphere which imparted such an essential function to nuclear weapons, the Europeans should have had no qualms about supporting the limited war strategy put forth by the Army. In fact, they did not support it. Between 1956 and 1958 the Army became the lone advocate of a limited war strategy, conventional or nuclear, as much by default as by design. The failure of the NATO-Europe and United States defense establishments to accept the Army's strategy became evident as opposition to the entire Pentomic

structure and its limited war concept of operations mounted along two "fronts"; one political, in Europe and the other military, in the U.S. In both cases the ultimate effect was to stagnate the progressive doctrinal and strategic developments the Army had made in the first half of the 1950s integrating tactical nuclear weapons into the battlefield.

Several related factors generated an increasingly vocal opposition in Europe to the use of tactical nuclear weapons. In June 1955 an allied exercise titled "Carte Blanche" was conducted in Central Europe simulating the employment of 335 tactical nuclear weapons over a 48-hour period against a Soviet armored assault. Exercise umpires estimated that 1,500,000 military personnel and civilians were killed and an additional 3,500,000 wounded.

These results were widely publicized in newspapers across Europe and the United States. Carte Blanche had made the results of a limited (tactical) nuclear defense painfully obvious to the Europeans, and Germans in particular. With respect to nuclear weapons, "Exercise Carte Blanche was probably the greatest single shock to European opinion..."⁷² For most Europeans, it provided evidence that war in Europe was a no-win situation. Any hopes of limiting a war, qualitatively and geographically, by the "restricted" use of tactical nuclear weapons were more than balanced by the advantages offered by the strategy of massive retaliation. It, at least, held out the possibility that a war

could be waged "over their heads" as the Soviet Union and the United States dedicated their retaliatory forces against each other, sparing Europe the horror of nuclear devastation.

Against the background of "Carte Blanche," the Army's Pentomic defense concept did more to foster European fears than instill confidence. The statements and writings emanating from the Army hierarchy revealed a wide disparity between the Army's definition of conflict termination and the European's desire for forward defense. FM 100-31, and its subsequent revisions, advocated greater troop dispersion across the battlefield, an inevitable by-product of potential tactical nuclear employment by the United States and Soviet Union. As the Pentomic division was pressed into service, the Army's concept of the nuclear battlefield grew progressively larger.

(June, 1956) The combat zone in an atomic war will be vastly extended in depth.

(June, 1957) I visualize that the atomic battlefield of the future will have much greater breadth and depth than battlefields of the past.

(October, 1958) Survival and victory on the atomic battlefield requires the ability to disperse our combat troops...There will be much greater frequency of movement of combat elements...

(December, 1958) ...it is possible that such concentrations [of armor] will only be able to operate effectively in areas which are more extensive than was previously the case...with less well-defined distinctions between the combat zone and rear area.

Similarly, the size of the battlefield in the "tactical problems" taught at the Army CGSC paralleled the Army's

public declarations. In 1952 a corps commander "attacked" along a 56 kilometer front. In 1957 the problem was run using divisions of the Pentomic configuration and outlined a corps area of operations 75 kilometers wide and 15 kilometers deep. The area was again extended in 1958 to 50 kilometers wide and 75 kilometers deep.⁷⁴

Coincident with the expansion of the battlefield was the Army's trend toward placing control of tactical nuclear weapons at very low levels of command. According to the Army, in the "fog of war" control of these weapons might eventually reside with the division or battalion commanders. The European governments, who generally viewed the use of tactical nuclear weapons as a penultimate response to aggression, did not want that decision in the hands of a young Army officer who could inadvertently escalate the conflict on his own.

Nuclear weapons have no business, therefore, either at the front with the field army or at the forward airfields of the air forces. As far as the ground forces are concerned, they must be removed, not only from the control of the brigade and divisional commanders, but also from the control of corps and army commanders.

...Any possibility of a conventional conflict turning into a nuclear one...must be carefully excluded by means of appropriate provisions in political and military planning.⁷⁵

In short, the Army's limited war Pentomic structure was translated by the Europeans into an ever-widening battle-ground fraught with the dangers made clear by "Carte Blanche." At best, massive retaliation was the stronger

deterrent and held some possibility of Europe surviving its failure, which could not be said of the limited war strategy. At worst, both strategies ultimately left Europe destroyed but the quick-death of "holocaust" or "vaporization" envisioned in massive retaliation was far more intellectually and morally satisfying than the slow, inevitable death by radiation which would threaten Europe following a war which observed the widespread, but "limited" use of nuclear weapons.⁷⁶

As in the case of Europe, the opposition in the United States had its base in the supporters of massive retaliation, most notably the Air Force and the Office of the Secretary of Defense (OSD). The public and government opposition so pervasive in Europe was not nearly as strong in the U.S. outside the DOD. For the American public, implementation of a limited war strategy by U.S. Armed Forces still left the battlefield overseas. Until Sputnik, Americans generally viewed themselves as invulnerable to Soviet nuclear threats. This perception was bolstered by frequent public statements by government and military officials as to the superiority of the U.S. nuclear deterrent.

The Army's peak in limited war planning occurred 1953-1955, when doctrine, strategy and deployed weapon systems formed a relatively cohesive concept of operations. Although the plans were never formally accepted outside the Department of the Army, the latter was prepared to conduct

a war in Europe which integrated conventional and tactical nuclear weaponry on the battlefield with the aim of defeating the enemy sufficiently forward to prevent even minimal territorial losses. Beginning in 1956, however, enthusiasm in the U.S. for the limited war strategy involving nuclear weapons started to wane. Between 1956 and 1960 efforts to upgrade the tactical nuclear weapon doctrine were neglected and relegated to the background with the election of John F. Kennedy. The reasons for the decline were numerous and complex, but two events appeared to be the key catalysts which ensured a limited (tactical nuclear) war strategy for Europe would lapse into obsolescence.

In the spring of 1956 the Joint Chiefs gathered to draft the Joint Strategic Objectives Plan for 1960 (JSOP 60).⁷⁷ The Army, just initiating its Pentomic shift, pressed for more troops and a greater conventional capability for the initial, potentially non-nuclear, stages of combat. The Army's requests were refused. With the exception of the Army Chief of Staff, the JCS was "determined to eliminate from military planning any consideration of the possibility of a conventional war with the Soviet Union."⁷⁸ The Chiefs, again with the exception of the Army, went on to endorse a short nuclear war concept in which the Army played only a limited role. The Air Force strategy of retaliation through airpower dominated JSOP 60. Strategic bomber vulnerability, emerging as a problem in 1955-56, was partially remedied

when the Air Force deployed its first operational long-range surface-to-surface missile, the Matador, to West Germany in 1954. The strategy of retaliation remained intact.

The second, and more important, event revolved around the development and deployment of U.S. IRBMs. In 1955 the Army and Air Force advanced proposals for an IRBM program; the Army, Jupiter and the Air Force, Thor. The most promising design would be adopted and the other dropped. The DOD position was that competitive design projects would speed ICBM development with the entire missile community benefiting from the technological advances introduced by each project.

The Army's design criterion called for a mobile IRBM, capable of reaching rear echelon targets in support of the ground forces. Soviet strategy was thought to rely heavily on large reserve forces and vital, fixed supply points behind the immediate combat zone to maintain an offensive. A medium-range missile under Army control was viewed as essential to eliminate these time-urgent targets which lay beyond the range of artillery and existing short-range missiles.

For reasons not entirely clear in the text, Secretary of Defense Wilson issued a memorandum in November, 1956 allocating the sole responsibility for IRBM production and deployment to the Air Force. Paragraph (5) of the memo stated:

In regard to the intermediate range ballistic missiles:

- a. Operational employment of the land-based IRBM system will be the sole responsibility of the U.S. Air Force.
- c. The United States Army will not plan at this time for the operational employment of the IRBM or for⁷⁹ any other missiles with ranges beyond 200 miles.

In spite of the memo's declared objective of "improving the effectiveness of operation of the DOD," it is possible to view the assignment of lone IRBM responsibility as a quiet bureaucratic coup for the Air Force. Initial Air Force research and development evolved out of air-breathing missile technology, rapidly becoming obsolete. The Army, on the other hand, viewed the IRBM as an extended range artillery projectile and appeared to be having great success in their Jupiter program. In initial flight tests Jupiter outperformed Thor. The first five Jupiter tests were classified as successful while early Thor tests "all ended abortively."⁸⁰

Considering their traditional opposition to and fear of any changes in responsibility for strategic missions, it is difficult to avoid the conclusion that the Air Force consciously and successfully persuaded OSD to eliminate the Army's long-range missile potential and shift the more promising IRBM program under Air Force cognizance.

Whatever the reason for the change, it was a tremendous loss to the Army. The combination of Air Force defense "psychology" and Sputnik turned Jupiter into an interim ICBM.

As speed of development assumed top priority, the Jupiter missile gradually lost all the mobility characteristics requested by the Army before and after its shift to the Air Force. Fixed launchers could be put into production more quickly than costly mobile launchers; hardening launch sites provided greater ease of maintenance handling and was cheaper than mobile launchers. Jupiter joined the ranks of Matador, Mace and Thor as a high-yield, immobile weapon with absolutely no tactical utility.

The missile became a weapon of retaliation. Deputy Secretary of Defense Quarles testified that

...what we are talking about instead is maintaining an instant retaliatory position with these missiles and one that can respond to tactical warning within fifteen minutes and actually launch the missiles in such a time.⁸¹

Such requirements, Quarles went on to describe, could only be filled by a non-mobile missile. Several years later, former President Eisenhower expressed his concept of the IRBM as a retaliatory weapon:

...located on bases on foreign soil, [the IRBM] could strike any target in Communist areas as well as could an ICBM fired from the United States.⁸²

Thus, not only did the Army lose control of the IRBM, it lost the capability to deliver, or order the delivery of, a tactical nuclear weapon at ranges beyond the immediate battlefield. The Air Force failed to provide any inter-service coordination for the surveillance, targeting and release of nuclear weapons against battlefield, or

near-battlefield, time-urgent objectives. The targeting priorities for the Air Force controlled weapons were vastly different from the Army's requirements.

The advances of the new longer-range ballistic missile technology probably would have been incorporated into the Army's TNW doctrine had it retained control of the Jupiter. Instead, Army doctrine stagnated without accounting for advances in guided and ballistic missiles, smaller and lower-yield weapons and increases in accuracy. Lacking institutional support for its limited war Pentomic strategy and the requisite modernization programs, Army tactical nuclear doctrine "froze" under the prevailing 1951 concepts put forth in FM 100-31. With no upgrade in sight for the already aging short-range tactical nuclear weapon systems and without a bipartisan (USA-SSAF) effort to integrate forces on the battlefield, there was little to be gained from aggressively pursuing an apparently outmoded concept of limited war.

IV. FLEXIBLE RHETORIC, INFLEXIBLE RESPONSE, 1961-1967

Nuclear weapons, even in the lower kiloton ranges, are extremely destructive devices and hardly the preferred weapons to defend such heavily populated areas as Europe.

Robert McNamara⁸³

In the years immediately preceding Kennedy's election (1958-60), the strategic climate in the United States underwent a dramatic revision. Civilian and military strategists began to refute the fundamental efficacy of massive retaliation to deter, and defend against, the vast majority of likely aggression scenarios. Since the United States was no longer the sole arbiter of nuclear force, NATO defense policy had to take into account the growing Soviet theatre and intercontinental nuclear capability. Problems of escalation and escalation control assumed centerstage in the debate as to which direction the policy would move.⁸⁴

Kennedy had expressed his opposition to the use of tactical nuclear weapons, fearing once initiated, escalation would be difficult, if not impossible, to control. As a Senator, Kennedy had stated:

Inevitably, the use of small nuclear armament will lead to larger and larger nuclear armaments on both sides, until the worldwide holocaust has begun.⁸⁵

Then, during the election campaign, he wrote:

The Soviet acquisition of nuclear weapons and the means for their delivery...now makes certain that a nuclear war would be a war of mutual devastation. The notion that the free world can be protected simply by the threat

of 'massive retaliation' is no longer tenable...responsible leaders in the West will not and should ⁸⁶not deal with limited aggression by unlimited weapons.

After election, Kennedy and his key defense advisors-- Robert McNamara, Alain Enthoven, and Maxwell Taylor--assumed office with a unique composite of strategic perceptions about tactical nuclear weapons in particular and limited nuclear war in general.

- (1) More manpower was required on a nuclear or integrated (conventional-nuclear) battlefield than conventional battlefield alone.
- (2) Collateral damage and civilian casualties would be difficult, if not impossible, to keep sufficiently low to prevent further escalation of nuclear warfighting.
- (3) The vulnerability of existing tactical/theatre nuclear forces indicated a very short (few days) tactical nuclear exchange with strong pressures to escalate or preempt to gain advantage.
- (4) The Soviets had no intention of fighting a limited nuclear war in Europe as conceived by Western strategists.
- (5) The absolute distinction between conventional and strategic nuclear war did not exist at the tactical nuclear level, further reducing prospects for controlling escalation. That distinction was to be maintained as clearly and unambiguously as possible.
- (6) Removing already deployed nuclear weapons from Europe would raise European fears of an imminent U.S. withdrawal and was to be avoided ⁸⁷until sufficient conventional forces were in place.

Heavily influenced by General Taylor, then retired from the Army and Kennedy's military representative at OSD, the President moved to implement the requirements of Flexible Response. Two events occurring almost simultaneously with Kennedy's accession to office made the renewed emphasis on

conventional capabilities explicit in Flexible Response a logical and viable avenue of pursuit. First, the U.S. Air Force reached its peak bomber strength in 1959-1960 with 1366 B-47s and 488 B-52s. Second, the first of 41 Polaris ballistic submarines went to sea on its premier deterrent patrol in November 1960.⁸⁸ With a stockpile of an estimated 18,000 nuclear warheads, America's strategic deterrent seemed unassailable. In keeping with the Administration's desire to raise the nuclear threshold, conventional force revitalization was now essential and, more importantly, feasible.

The primary reasoning behind the adoption of Flexible Response was to "reduce the reliance on nuclear weapons for deterrence and defense and increase the reliance on conventional forces, especially in NATO."⁸⁹ In a special message to Congress on 28 March 1961, President Kennedy outlined the budgetary and strategic requirements of his Administration's "New Look." They included: (1) a strengthened capacity to meet limited and guerilla warfare, (2) expanded R & D on non-nuclear weapons, (3) increased flexibility of conventional forces, (4) increased non-nuclear capabilities for fighter aircraft, and (5) increased personnel, training and readiness for conventional forces.⁹⁰ Doctrinally, Flexible Response was a vast change from the massive retaliation/unrestricted nuclear weapons use philosophy of the 1950s. Practically, however, there was little change in the

capabilities required to make the new strategy truly effective.

The NATO-Europe response to Kennedy's proposals, while unexpected, was not out of strategic character. Less than 60 days after the special message to Congress, the West Germans expressed their "uneasiness over the new emphasis on conventional weapons in the strategic military planning of the Western Allies."⁹¹ Two weeks later British Minister of Defense Harold Watkinson summarized the European allies' feelings toward the new U.S. strategy:

...we do not believe that NATO can or should provide massive conventional forces as could hope to deal with any conventional attack, however large, without recourse to nuclear weapons.⁹²

More to the point was the fact that Flexible Response had suddenly brought to the surface key conceptual differences between Europeans and Americans concerning deterrence and defense. While both were apparently ready to accept the inevitability of "essential U.S.-Soviet equivalence" in nuclear weapons, each had differing ideas about how to deal with the problem. Many of the European political elite felt that U.S.-Soviet strategic thought was beginning to converge around a mutually acceptable concept of "Assured Destruction."

The changes made in the second edition of [Sokolovsky's Soviet Military Strategy], which came out shortly afterwards, made it more apparent that the Russians were themselves tending to draw the same conclusions⁹³ as those emerging from the American strategic analysis.

To embark on a massive conventional rebuilding program was viewed as a destabilizing and dangerous movement away from a stable strategic balance and toward establishing acceptable boundaries for a European-theatre limited war. Increasing conventional forces would only undermine the credibility of the U.S. nuclear deterrent by supporting the widespread perceptions in Europe of U.S. reluctance to resort to strategic nuclear systems to defend NATO-Europe sufficiently early to prevent the "liberation of a corpse."

Whether or not the Flexible Response strategy actually called for substantial increases in conventional forces was contentious, but Europeans sincerely believed it did and felt any substantive buildup would be useless against a Soviet attack presumed to "go nuclear" at the onset of hostilities. One German defense analyst wrote that Soviet doctrine viewed a European war as consisting of two phases, the first of which

...will be of short duration and will begin with a massive exchange of nuclear strikes which will destroy the larger cities and industrial centers.⁹⁴

An anonymous French analyst expressed much the same conclusion.

[Following a] massive nuclear strike...Soviet ground forces will maneuver on broad fronts, advancing in the direction of the main thrust at an average rate of 60 kilometers per day.⁹⁵

The European's conclusions were supported not only by Soviet military writings but by Khrushchev himself. During

a series of interviews with Walter Lippmann, published in a widely read book titled The Coming Tests With Russia, Khrushchev stated that

...we do not see any value in small, tactical atomic weapons. If it comes to war, we shall use only the biggest weapons. The smaller⁹⁶ ones are very expensive and they can decide nothing.

While the Soviet Premier's statement was to be taken with a large grain of salt, his words did support European analysis of Soviet war-fighting doctrine.

Even if the conflict began and remained conventional for a considerable length of time, Europeans doubted NATO non-nuclear forces would be able to overcome Warsaw Pact advantages in geography, military initiative (surprise) and mobilized (not mobilizable) manpower. Ironically, the European allies considered the deployed tactical nuclear weapon systems a vital escalatory threat at a time when the Americans were attempting to reduce their impact.

(French) In the case of aggression by ground forces, only an army provided with nuclear weapons is capable--whatever the initial form of aggression--of reacting in a sufficiently flexible and powerful manner to break the initial thrust of the adversary.

Only nuclear weapons will⁹⁷ prevent our forces from being submerged by numbers.

(British) But conversation with officers of, at any rate, the British NATO contingent makes it clear that the doctrine has spread that it would be impossible to meet any considerable Russian move, even if undertaken with conventional weapons⁹⁸ alone, except by using tactical nuclears from the outset.

The presence and threatened early use of tactical nuclear

weapons was believed necessary to maintain a high level of uncertainty in the Soviet mind as to NATO's actual plans to employ them.

Although Kennedy and McNamara never intended to wholly replace tactical nuclear weapons, appropriate conventional force increases would result in a more credible deterrent and a higher nuclear threshold on the battlefield.

Secretary McNamara repeatedly indicated in his annual posture statements that he was aiming for enough conventional forces to be able to fight not just a small delaying or local action in some critical area like Berlin, but rather a large conventional war, for 90 days or more, against the whole field army maintained by the Warsaw Pact Powers.

The U.S. position was interpreted by NATO-Europe as a decisive move toward a limited war warfighting strategy. In the mid- to late-1950's limited warfare was associated with very localized "skirmishes." The Kennedy Administration's concept appeared to extend the possibility of limited war to include all of Europe and any conflict short of general nuclear exchange.

Secretary of Defense McNamara, in a prepared testimony for Congressional hearings in 1961, described the function of limited war forces in some detail.

Our limited war forces should be properly deployed, properly trained, and properly equipped to deal with the entire spectrum of such actions...

What is being proposed at this time is not a reversal of our existing national policy but an increase in our non-nuclear capabilities to provide a greater degree of versatility to our limited war forces.¹⁰⁰

Europeans remained unconvinced that a strategy of deterrence based on a flexible, or graduated, response would prove any more effective than one threatening an assured nuclear retaliation. For them deterrence not only described the preeminent defense strategy, but also circumscribed the limits of a conventional strategy. Deterrence alone was of much more immediate importance in spite of the well documented decline of the nuclear asymmetry which had previously supported it. "Europeans," claimed French General and strategist André Beaufre, "generally prefer to maintain deterrence at its maximum by the threat of total catastrophe rather than open the possibility of limited war."¹⁰¹

U.S. DOD attempts, particularly through systems analysis, to convince the European allies of the utility and affordability of flexible response were greeted with skepticism and confusion. The more opposition Europeans exhibited to the strategy, the "more refined" the systems analysis appeared to get. Detailed reviews of the "measurable aspects of military effectiveness" were continually studied, evaluated and reformulated. By 1965, the Office of Systems Analysis in OSD estimated that at least half of the 175 Soviet divisions were essentially paper units while the remaining divisions were only about 1/3 as effective as those of the U.S. Division firepower scores, a rough measure of the warfighting capability of a division unit, were revised such that the U.S.:Soviet ratio rose from 1.1:1 in

1962 to a peak of 1.7:1 in 1967, strangely enough the year NATO officially adopted the flexible response strategy.¹⁰²

In areas where numerology could not correct existing quantitative imbalances, superior Western technology would provide the margin of safety:

- (1) Although NATO had only 55 percent of the Warsaw Pact's tank inventory, NATO tanks were deemed qualitatively better.
- (2) Although Warsaw Pact tactical airpower exceeded NATO's by 28 percent, NATO had "considerably more aircraft in its worldwide inventory, and thus a much greater re-inforcement capability."¹⁰³
- (3) Although the Warsaw Pact ammunition stocks were larger, NATO had better ammunition and greater firing accuracy.
- (4) Although the Warsaw Pact had more soldiers and combat vehicles, NATO had more men in logistics and more transport vehicles per combat vehicle, therefore, a better capacity to supply fuel and ammunition.

Europeans remained justifiably suspicious of the frequently revised Pentagon analyses and produced their own "to demonstrate the infeasibility of an all conventional defense."¹⁰⁴ Additional confusion arose from glaring inconsistencies in the U.S. declaratory strategy and deployment practices. While the Europeans heard about the necessity of increasing non-nuclear forces, they saw U.S. active duty military strength fall from 1,066,404 in June 1962 to 969,066 in June 1965. Not until U.S. troops were introduced into Vietnam did U.S. strength climb over one million. With the exception of the Army's reorganization away from the Pentomic division and a slight increase in the

U.S. "tooth to tail" ratio, there was no change in the five divisions deployed in Europe.

Paralleling the absence of U.S. conventional force growth was a 60 percent increase in the theatre/tactical nuclear warheads in Europe. Between 1961 and 1964 the nuclear arsenal grew from approximately 4000 warheads to over 7000, most of which were short-range weapons (under 25 kilometers). Of 180 Pershing 1A short-range missiles deployed, 72 were placed under a dual U.S.-West German control system with the United States maintaining custody of the warheads and West Germany controlling the launchers. Simultaneously, the M-110 203 mm nuclear artillery shell was deployed in Belgium, Italy, Greece, Denmark and West Germany under similar "dual-key" arrangements.¹⁰⁵

However flexible a force the United States was claiming in its rhetoric, deployment practices signaled virtually no change from the previous reliance on tactical nuclear weapons. More than ever before nuclear weapons, strategic and tactical, seemed to be at the core of U.S. defense strategy. Stripped of its "rhetorical baggage," Flexible Response amounted to little more than a strategy of controlled escalation in most relevant NATO-Warsaw Pact scenarios, Kennedy's fears of escalation notwithstanding.

After two years in office, Secretary McNamara readily admitted NATO conventional forces were still inadequate to repulse a serious Soviet attack. The nuclear weapons

deployed in the theatre in Europe were still an integral part of NATO's defense, no less so than before Flexible Response.

The presently programmed forces, in general, could by non-nuclear means alone counter a wide spectrum of Sino-Soviet bloc aggressions in regions other than Europe. With regard to Europe, the presently programmed U.S. forces, together with the present forces of other NATO countries, would not be able to contain an all-out conventional Soviet attack without invoking the use of nuclear weapons.¹⁰⁶

In early 1964 McNamara was even more explicit about the weaknesses in the NATO conventional force structure, stating that "the defense of Europe against an all-out Soviet attack, even if such an attack were limited to non-nuclear means, would require the use of tactical nuclear weapons on our part."¹⁰⁷ Viewed through European eyes, the "New Strategy" of Flexible Response offered no tangible advantages over the existing strategy which relied first and foremost on nuclear weapons.

The Europeans had come to view the tactical nuclear weapon systems as an important link in NATO's defense posture, acting to "couple" American and European security interests and bridging the gap between the questionably credible conventional response to aggression and the ominous initiation of strategic nuclear war. Aside from substituting for costly conventional forces, TNW under U.S. control ensured rapid American involvement in any critical Euro-Soviet confrontation. Even though existing NATO TNW

left Soviet territory unthreatened, the presence of these weapons on European soil enhanced their political value with respect to the European's conception of defense. However outmoded, they still contributed to overall European security, a (European) perception the Americans were reluctant to acknowledge.

The entire Alliance seemed to realize that in order to be effective some sort of coalition strategy was necessary which gave at least the impression of unity and common defense interest among the members. Continued unilateralism and intra-alliance bickering would erode the very underpinnings of NATO's deterrent posture and lead to a potentially dangerous proliferation of nuclear weapons in and out of the Alliance. Already two members other than the United States possessed independent nuclear forces which, to the U.S., were a strategically unwise diversion of valuable resources otherwise available for conventional armament. For any strategy to be acceptable to NATO-Europe, it would have to take into account European desires for an equitable sharing of risk--in order to make the U.S. nuclear deterrent as credible to the Europeans as to the Soviets--and rely substantially on defense via the putative deterrent effect of US/NATO nuclear weapons. The conventional force-limited war option explicit in the Flexible Response strategy was not a viable alternative because "such a stalwart local defense might make the world safe for war in, and confined to, Europe."¹⁰⁸

The efforts to foster allied cohesion between 1961 and 1967 were rewarded when NATO unenthusiastically adopted Flexible Response as its declaratory strategy in 1967. New planning guidance was outlined in a NATO Military Council document entitled "Overall Strategic Concept for the Defense of the NATO Area," known colloquially by its serial number MC 14/3. It replaced previous NATO plans (MC 14/2) for an early and massive use of nuclear weapons in response to Soviet aggression with a strategy of controlled and graduated escalation across an entire force employment spectrum.¹⁰⁹

In order to accomodate the divergent US/NATO Europe positions on tactical nuclear weapons, MC 14/3 was purposefully written to reflect internal compromise and ambiguity. While the document called for a serious effort at a non-nuclear forward defense, it never precluded early nuclear weapon use. For the U.S., the principles embodied in MC 14/3 meant that tactical nuclear weapons use would be "larger but later and only if necessary." It offered the opportunity to avoid a strategic nuclear exchange by terminating a limited war in short order on European soil. The Europeans interpreted these same principles to mean that tactical nuclear weapons use would be "smaller and earlier." Little change was seen from previous TNW application policy except for the modestly more selective and restricted nature of MC 14/3.

Overshadowing these interpretations was the philosophy that TNW would be used initially as a "demonstration of NATO's resolve" to escalate the conflict if necessary. In 1968 U.S. Secretary of Defense Clifford presented to NATO's Nuclear Planning Group (NPG) a plan calling for one or two nuclear detonations in the early phases of a massive Soviet assault into NATO territory. These demonstration type nuclear bursts, preferably exploded at sea, would be used to show the Soviets that NATO was not afraid to resort to nuclear weapons.¹¹⁰

The net result of this equivocal NATO approach to European defense was accurately summed up by retired French Army Colonel, Marc Geneste. The shift to Flexible Response

...called for a large enough nuclear component to give the Europeans an excuse for not strengthening their conventional forces, and relied sufficiently on conventional capabilities to convince the American public that there was still a chance to avoid dreaded nuclear warfare...¹¹¹

According to Geneste, the TNW employment guidance contained in MC 14/3 was such that if deterrence failed and a war erupted in the European theatre, the Soviet Army would reach the Rhine while the allies debated whether to use tactical nuclear weapons.

Geneste's conclusions were on target. Since the guidelines established in MC 14/3 were sufficiently "flexible" to accommodate all views, the contradictions in planned application of TNW foreclosed any attempt to devise an effective war-fighting doctrine which included these weapons.

Initial employment was designed to convince the Soviet's of NATO's political will to escalate and thereby (with luck) force a termination of hostilities. Tactical nuclear weapons were to be used to effect a pause in the fighting, allowing each side to reassess its risks, costs and potential benefits. Early TNW use was not considered an applicable military tool to defeat the enemy but rather one which would bring him to his senses by dramatically heightening the risk of further, more destructive escalation.

Finally, the outcome of the Flexible Response debate and the subsequent adoption by NATO of that strategy was to create an atmosphere for strategic thinking and planning which separated a controllable and winnable conventional war from any conflict involving nuclear weapons. The two were established as distinct and mutually exclusive. Conventional wars involved calculable risks. Nuclear war, even if limited, did not. Crossing the "firebreak" into the realm of nuclear weapons meant entering the unknown. The McNamara quote which opened this chapter continued with a concise description of the Kennedy Administration's perception of tactical nuclear weapon employment.

Furthermore, while it does not necessarily follow that the use of tactical nuclear weapons must inevitably escalate into global nuclear war, it does present a very definite threshold beyond which we enter a vast unknown.¹¹²

In short, conventional wars were viewed as defensible while nuclear wars were only deterable.

Flexible Response was just half a strategy. Deliberately vague to the Soviets about the precise nature of NATO's response to aggression, it was also vague to NATO's own forces and political leaders. The essential changes and additions inherent in the shift to Flexible Response were more often than not cosmetic and never implemented to the degree needed to make the strategy viable. Warfighting doctrine and its development, where tactical nuclear weapons were concerned, tended to assume a very low priority.

A. DENUCLEARIZING TACTICAL NUCLEAR THOUGHT: THE ROAD TO FLEXIBLE RESPONSE

Within the armed services, the transition from the nuclear oriented retaliation strategy of the 1950s to flexible response took place in a relatively short span of time; begun in earnest in 1959, it was essentially complete by late 1962. The change coincided with the emergence of a Soviet intercontinental nuclear delivery capability and the West's gradual realization of the implications of this development. The publicity given to the alleged "missile-gap" between U.S. and Soviet nuclear delivery forces shattered American perceptions of a one-continent nuclear war and generated pressures for the adoption of a strategy which would minimize the possibility of an escalatory process eventually threatening the United States. The uncertainty surrounding the role and missions of tactical nuclear weapons in NATO strategy became a focal point in the

trans-Atlantic debate over flexible response described earlier.

The lapse of the Army's Pentomic concept and associated employment strategies did not occur immediately following Kennedy's election in November 1960. Official DOD and Army positions on limited and nuclear war began to diverge in late 1958 and 1959, entering a period of transition from 1959 to 1961. Rather than initiating changes to U.S. defense doctrine and force posture, Kennedy's election accelerated a movement already underway in the Department of Defense.

The Secretary of the Army's 1959 Annual Report indicated that the Army considered Pentomic divisions sufficiently flexible to manage all types of warfare, conventional or nuclear. Although tactically oriented toward fighting on a nuclear battlefield, each unit possessed "unprecedented firepower" and "mobility" to defeat the enemy on all levels of theatre combat. The Secretary's confidence in the ground forces continued unabated into mid-1960. The introduction of his FY 1960 Annual Report stated

...I am happy to report that, in fiscal year 1960, the Army was qualitatively--in terms of its manpower, its equipment, its training, and its combat readiness--the strongest¹¹³ land force the Nation has ever had while not at war.

In spite of his very positive outlook, attitudes in the Office of the Secretary of Defense (OSD) and Congress were changing. A study completed in 1959 by the Washington Center of Foreign Policy Research for the Senate Committee

on Foreign Relations concluded that "heavy reliance on tactical nuclear weapons cannot be expected to compensate for the numerical inferiority of local forces."¹¹⁴ The approaching change in the official DOD position was reflected in testimony by Defense Secretary McElroy during Congressional hearings in 1959 on missile and space activities. Commenting on the possibility of fighting a limited war in Europe against the Soviet Union, McElroy concluded that

The people of the country should realize that if we are going to fight Russia, we are not going to fight them on the ground in the main. There will be some conflict on the ground, but general war is the only kind of war that we visualize fighting with Russia.¹¹⁵

The Army's entire ground war philosophy and planning for limited, potentially nuclear, war was relegated to a category of wishful thinking. General war, connoting a large-scale nuclear exchange, was emerging as the dominant theme for a NATO-Warsaw Pact confrontation, leaving the Army, once again, a minor role in the most important theatre of U.S. defense strategy, NATO-Europe. Although flexible response was based on a concept of graduated escalation and response, the concept was not extended to operational planning and practice. The ability to escalate or de-escalate at all levels of combat within a given theatre of operations was not to be incorporated into the Army's land warfare doctrine for Europe because of the perceived unlikelihood of establishing reliable processes of escalation control with the Soviet Union after the onset of hostilities.

The Army begrudgingly accepted the President's directive to reorganize away from the Pentomic division. By 1961, official Army posture was in step with the Administration's flexible response strategy. The prospect of and preparation for limited nuclear ground warfare was omitted and replaced by the vogueish distinction between limited conventional war and general nuclear war. The Army Secretary's FY 1961 Annual Report, the first since Kennedy's election, brought into sharp focus the effect of the strategic changes on Army strategic thinking. "The transitions and changes which began in the later part of fiscal year 1961," the report stated,

...represent a realization of and response to the dual requirement for a stepped up capability for non-nuclear land power and limited war on the one hand and a simultaneous capability for all-out nuclear warfare on the other.¹¹⁶

The changes instituted under the new organizational concept called ROAD, Reorganization of Army Divisions, were more administrative and structural than positive additions to firepower and flexibility. The Pentomic division had a serious capability for either conventional or nuclear warfare. The new ROAD division forfeited the tactical nuclear weapon option in exchange for a maximum of 2500 men and a modest increase in conventional firepower. The following chart illustrates the changes in manpower per division from 1953 to 1962.¹¹⁷

	Pre-Pentomic (1953-55)	Pentomic (1956-60)	ROAD (1961)	Percent Change (1956-61)
Airborne Div.	17,085	11,486	14,000	21.9%
Infantry Div.	17,455	13,748	15,000	9.1%
Armor Div*				NA

*Approximately 15,000 throughout period because of its inherent mobility and heavy firepower.

The new divisions detracted from the Army's flexibility in the field. The Secretary of the Army's FY 1962 Annual Report contained none of the confidence and optimism exhibited less than two years earlier in his FY 1960 report (p. 87). The tone of the 1962 report was one of recovery, not strength.

During the past year the Army has attained renewed vigor and vastly improved readiness...operational capability and combat readiness have been markedly enhanced.¹¹⁸

Limited non-nuclear aggression became the standard toward which Army planning would orient. The shift in national policy in 1961 was followed by an equally dramatic change in the direction and emphasis in Army training, interest, and doctrinal development. Training: In 1962, of 7 major US/NATO training exercises involving U.S. ground forces, 3 were Command and Control procedural exercises, 1 was logistically oriented, and 4 were small scale division field exercises on a nuclear-free battlefield. The largest US/NATO ground force exercise in 1963, BIGLIFT, trained units in overseas reinforcement and use of prepositioned stocks, again in a nuclear-free environment.¹¹⁹

Similarly, classroom training reflected the decline of tactical nuclear planning.¹²⁰ The curriculum of the Army's Senior Officer Nuclear Weapon Employment Course was revamped and the course retitled the Senior Advanced Operations Course. The CGSC Department of Nuclear Weapons briefly became the Department of Special Weapons before being abolished in 1962. Compared with the 614 annual hours of nuclear weapon instruction in 1957-1958, the CGSC curriculum contained 33 hours of such instruction in 1962, 21 hours in 1966, and only 16 hours after 1967.

Interest: Previously the center of attention, U.S. forces in Europe were "demoted" by a combination of the growing war in Vietnam and the Administration's preoccupation with strategic nuclear doctrine and posture. In spite of the Army's increase from 11 to 16 combat-ready divisions, the European contingent remained static at 5.

In January 1968, Secretary McNamara announced a decision, based on foreign exchange deficits, to redeploy roughly 34,000 troops from Europe to the United States. The Secretary of the Army attributed the reduction to a relaxation in East-West tensions. According to the Secretary,

...no real East-West crisis marred the international picture. Thus the cost of maintaining five U.S. Army divisions in Western Europe and a separate brigade in Berlin was reassessed during the year...and it was decided to reduce the force by about 28,000.¹²¹

Not only was the Army hampered by the explicit deemphasis of a battlefield nuclear option, but it would now have to

conduct its mission in Europe with fewer forward deployed forces.

Even the DOD Annual Reports revealed the declining importance of European-based U.S. forces and tactical nuclear strategy. In 1962, the Annual Report discussed these forces in 4½ pages; in 1963, 1½ pages; and in 1964, 25 sentences. By 1967, Europe, Africa and the Middle East were combined into one section less than 1½ pages in length. Each year the reports were revised, progressively deemphasizing tactical nuclear warfare and the Army's associated capabilities.

In 1964 McNamara outlined the DOD's achievements as of June in all areas of defense:

Compared to 1961, we had achieved on 30 June 1964:

- A 150 percent increase in the number of nuclear warheads available in the Strategic Alert Forces;
- A 50 percent increase in the number of strategic bombers on alert;
- A 45 percent increase in the number of combat-ready divisions;
- A 75 percent increase in airlift capability;
- A 44 percent increase in the number of tactical fighter squadrons;
- A 800 percent increase in the Special Forces trained to deal with counterinsurgency.¹²²

Conspicuously absent--even more so considering McNamara's penchant for precision with numbers and percentages--was any reference to the 60 percent increase in deployed tactical nuclear weapons during that same period. While the failure to mention the TNW increase was a clear indication of the Administration's effort to play down the weapons,

the apparent contradiction between declaratory and action policy was more difficult to explain.

Left to itself, the Kennedy Administration probably would have reduced the deployed tactical nuclear arsenal substantially. However the momentum of a (nuclear) deployment initiated well before Kennedy's election was much more difficult to break than defense officials had anticipated. In the first place, the sheer politics of removing all or part of an American weapon system from Europe, especially a nuclear system, invoked almost insurmountable obstacles. Delivery vehicles had been purchased or ordered by the Europeans to enable them to employ those weapons kept under a dual-key control arrangement. Simultaneously, the European governments had expended a great deal of energy justifying the expense and inherent dangers of the weapons to the public. A reversal would not only look foolish but undermine confidence in the leadership. Second, the visibility of the tactical nuclear weapons and the parallel emphasis on the uncontrollability of escalation once the tactical nuclear weapons were released quelled European fears of U.S. "decoupling." Enacting a substantial reduction of the TNW arsenal would make the United States a target for a myriad of accusations from "abandoned allies." Third, the Soviet Union showed no signs of reducing its theatre nuclear forces. If nothing else, a large U.S. arsenal would act as a deterrent to the Soviet employment of the weapons.¹²³

Finally, the professional interest in limited nuclear warfare and battlefield nuclear weapons, as expressed by articles in the open literature by Army officers, waned as interest in Vietnam-like unconventional warfare boomed. From 1961 to 1967 a total of 24 articles appeared in Military Review related to nuclear warfare compared with 112 on unconventional warfare. To put these figures in perspective, in the five-year period covering 1955-1959, 132 articles on nuclear combat appeared in Military Review.¹²⁴ Without institutional support there was little motivation for devising means to employ a dead-end strategy which included the use of tactical nuclear weapons.

Doctrine: Through the early and mid-1960s, Army tactical nuclear thought went into remission, constrained by political pressure from both sides of the Atlantic. FM 100-30 (1951) remained the most thorough and "current" unclassified guidance available in the Army field manual library. The introduction of smaller and more accurate nuclear weapons into the arsenal was virtually ignored.

FM 61-100, "The Division" (1962), was among the last manuals to discuss battlefield nuclear warfare in any depth. The introduction stated that the purpose of the manual was to cover "division level operations under active or non-active nuclear conditions. When appropriate, modifying guidance for non-nuclear warfare is included."¹²⁵

The manual, while indicative of the Army's reluctance as

late as 1962 to abdicate the nuclear battlefield concept, was devoted largely to offensive action subsequent to nuclear fire. Little, if any, guidance is offered governing employment options, alternatives or tactics. After 1962, the FM series lay dormant with respect to tactical nuclear weapons, doctrine and strategy.

The guidance provided in MC 14/3 in 1967 committed NATO to conduct deliberate, but controlled, escalation if aggression could not be contained. Not only did the guidance thus restrict NATO forces to a nuclear defensive role, it lacked any clarity as to targets, timing and size (yield and number) of weapon employment. Defensive employment doctrine, which should have been treated exhaustively, was, at best, nebulous because of uncertainties about Soviet use of TNW and West European permission to use NATO nuclear weapons.

The problem was evident in testimony by General Norstad in 1966 before Congress concerning NATO's nuclear response options to Soviet aggression. Norstad explained nuclear employment might mean the use of as few as five or as many as 200 weapons. "We are talking in that range."¹²⁶

Moreover, this ambiguity of response was reinforced by the White House and DOD positions described earlier and continued by the Johnson Administration after Kennedy's death. President Johnson explicitly ruled out limited nuclear war options as a component of U.S. defense strategy in his 1965 "State of the U.S. Defenses" message to Congress.

The strength, deployment, and mobility of our forces must be such that, combined with those of our allies, they can prevent the erosion of ¹²⁷the free world by limited non-nuclear aggression.

By failing to make an investment in the capabilities to fight a low-level nuclear war, the Administration and Defense Department consciously excluded an entire range of options implicitly a part of a flexible response strategy. According to James Schlesinger, writing in support of a tactical nuclear capability before his tenure as Secretary of Defense, this was "not only because of the expense, but because the creation of options might tempt us to go through the firebreak, and would certainly give others the impression that we were willing to do so."¹²⁸ No doubt the move to flexible response had improved the United States' ability to respond to wholly conventional, localized wars such as Vietnam. However, in the context of a NATO-Warsaw Pact confrontation, the new doctrine allowed for little more flexibility than was possible during the Eisenhower years of massive retaliation. NATO response to an impending conventional defeat remained early resort to strategic nuclear systems.

In addition, the characteristics of a large portion of the operational nuclear force in Europe precluded a truly tactical employment option. The Sergeant surface-to-surface missile took approximately 30 minutes to position, erect and complete pre-launch preparations, followed by a 44 minute

countdown, the last 20 of which were automatic. Each Pershing 1A had similar pre-launch requirements and required a conspicuous train of four support vehicles.¹²⁹ In either case, a one-hour launch cycle preceded by lengthy request-release procedures lent the missiles a questionable real time tactical value.

By the time NATO officially adopted the Flexible Response strategy in 1967, the tactical nuclear arsenal in Europe was aging and unable to effectively support tactical missions beyond battlefield artillery range. A prescient German had observed the decline in the quality of U.S. nuclear thinking as early as 1962 and noted that "the U.S. has, furthermore, fallen behind in the very field that was once peculiarly its own--that of nuclear strategy."¹³⁰ That a European should have made that observation was especially important. His words should have keyed U.S. policymakers and strategists to the shortcomings of a nuclear doctrine bound exclusively in "intercontinental" terms.

V. THE DIALOGUE BEGINS, 1968-1977

...the biggest fault with current NATO strategy has been a failure to relate its conventional force improvement program to a doctrine for nuclear weapons.

Richard Burt¹³¹

By 1968 detente and the American involvement in Vietnam were already dominating domestic debate on foreign policy. The importance of detente discouraged the formulation of any unnecessarily provocative military policies toward the Soviet Union. Relations were "too good" to risk the tenuous stability which seemed to pervade East-West interactions. Sen-

or Mike Mansfield, supporting the amendment bearing his name to reduce U.S. troops in Europe, argued that the threat of Soviet invasion had diminished. He claimed that "relations between all NATO countries and the Soviet Union are excellent-first rate...The contacts are good, economically, culturally, and socially."¹³²

The increase in trade between East and West and the psychological reassurances inherent in detente were extremely important, particularly to the West Germans, and impacted heavily on European perceptions of national security. Designing a tactical nuclear weapon employment doctrine outlining a war-fighting posture for NATO would not be considered "in the spirit of detente." The Nuclear Planning Group's solution was to use a small number of tactical weapons as a warning and indication of NATO's resolve. The

next step would involve some degree of escalation to strategic systems.

In the United States, American involvement in an (un)conventional war in Vietnam continued to stifle tactical nuclear thinking and placed serious discussion of the NATO-Europe aspects of flexible response on a back burner. Meanwhile, civilian officials at the Pentagon and State Department were eager to maintain the outmoded "firebreak" concept, arguing that the use of tactical nuclear weapons would inevitably erase the existing distinctions between conventional and nuclear war. What nuclear thinking was done was confined to strategic nuclear systems and the Soviet, and developing Chinese, ICBM threat.

The McNamara promises of a revitalized conventional force in Europe, however, had failed to materialize as U.S. defense dollars and soldiers were funneled into southeast Asia. By 1971 the success of the flexible response strategy was highly questionable. A Brookings Institute analysis of U.S. forces in Europe revealed little change in the fundamental U.S. position since the mid-1950s. According to Brookings analyst, John Newhouse, the role of U.S. soldiers in Europe in 1971 was

...to deter the Warsaw Pact from applying military force against NATO and, in the event of conflict, to create the likelihood that non-nuclear combat will be sufficiently intense and prolonged to allow the nuclear powers (1) an opportunity to work out a diplomatic solution...and (2) time to take a measured decision regarding the use or non-use of nuclear weapons.¹³³

The Brookings description sounded much like the "tripwire" and "plate-glass" strategies of the Eisenhower era when U.S. forces were present to generate a pause in the fighting for the same reasons outlined by Newhouse above. Virtually no progress had been made toward building a credible conventional deterrent or even a conventional adjunct to the nuclear forces.

In fact, erosion of a truly "flexible" response was already well underway when it was finally adopted by NATO in 1967. Soviet force expansion and modernization dwarfed the scarce advances made by NATO. The so-called equalities and advantages for NATO had essentially disappeared in the ten years following the OSD's systems analysis of the NATO-Warsaw Pact balance. Echoes of 1960 were present in a 1971 statement by the West German Defense Minister that the "conventional forces at the disposal of NATO in Western Europe ...are inadequate for defending NATO territories in Europe... for any length of time."¹³⁴

Coincident with the deterioration of the flexible response posture in Europe between 1971 and 1973 was a dramatic alteration in the strategic nuclear environment. The negotiations and agreements resulting in the SALT I treaty (May 1972) and the Agreement on the Prevention of Nuclear War (June 1973), both bilateral U.S.-Soviet agreements, were conducted and concluded in the midst of growing doubts about Flexible Response. The composite of these events prompted

a reappraisal of NATO-Europe strategy similar in scope to the reappraisal which led to the shift to Flexible Response in 1960-61. The period 1971-1973 was a key turning point in theatre/tactical nuclear thinking. Waning interest in the subject began a slow, but notable, reversal.

SALT I acted to codify a U.S.-Soviet balance which, in the eyes of Europeans, offset the U.S. strategic nuclear threat. According to Helmut Schmidt, "SALT neutralizes their (U.S. and Soviet) strategic nuclear capabilities."¹³⁵ Parity effectively foreclosed early resort to a strategic nuclear option for the United States, placing in doubt the backbone of NATO's deterrent. In spite of tacit acceptance of "essential equivalence" since the mid-1960s, its implications were more or less ignored until SALT I. The SALT I treaty, in conjunction with questions of U.S. hard target kill capability and vulnerability of U.S. land-based strategic forces, gave official recognition to the new balance and raised a myriad of perceptual, if not actual, problems.

At issue was not so much any notion of absolute superiority as the relative confidence and credibility with which the United States could provide NATO with an extended deterrent. That deterrent rested not only on Soviet attitudes toward, but Allied confidence in, NATO strategy.

One of the original and ongoing justifications for tactical nuclear forces was the linkage established, in time of war, between a failing conventional defense in Europe and

U.S. willingness to respond with strategic systems after a brief tactical nuclear "interlude." The credibility of this link was seriously undermined if U.S. strategic forces were held in check by the Soviet's arsenal. The ultimate effect was to magnify the existing disparities between East and West theatre nuclear and conventional forces (Table 1). Since little could be done to affect the strategic nuclear balance following SALT I and the conventional force balance had again assumed "uncorrectable" proportions, theatre nuclear forces began to receive newfound attention. Analysts soon realized that the average age of NATO's tactical nuclear weapons was nearly 15 years, impacting heavily on the expected, and required, reliability of the force. More distressing was the fact that the bulk of the weapons were stored at less than 50 well-marked and poorly defended sites.¹³⁶ As a result, they were highly vulnerable to a preemptive Soviet missile and/or aircraft strike. A similar vulnerability appeared to be emerging for U.S. land-based ICBMs as estimates of Soviet ICBM accuracy began to fall within hard-target kill tolerances.

The Agreement on the Prevention of Nuclear War (APNW) had a similar effect, but for different reasons. Negotiations were conducted in parallel with the strategic arms talks, generating fears among many Europeans of an impending U.S.-Soviet condominium, a bilateral pact between the two superpowers allowing each to peacefully dominate its

TABLE I: NATO AND WARSAW PACT LAND-BASED THEATRE NUCLEAR
AND CONVENTIONAL FORCES--1973

UNITED STATES/NATO	RANGE (km)	DELIVERY VEHICLES	ESTIMATED WARHEADS
<u>Conventional Forces</u>			
Combat troops in north & central regions	NA	600,000	NA
Main battle tanks in north & central regions	NA	6,500	NA
<u>Nuclear Forces</u>			
Artillery (203mm, 155mm)	14/29	686	1372
Honest John	40	150-200	2000
Lance	110	10-20	20
Sergeant	140	20	200
Pershing 1A	740	180	270
Short-range dual-capable aircraft ¹	various	1000-1300	1500
Medium-range bombers (Vulcan, FB-111A)	2000+	77	98
French Mirage IV	1600	36	36
<u>SOVIET UNION/WARSAW PACT</u>			
<u>Conventional Forces</u>			
Combat troops in north & central regions	NA	900,000	NA
Main battle tanks in north & central regions	NA	17,000	NA
<u>Nuclear Forces</u>			
Artillery (203mm, 240mm)	29	?	?
Frog 1-7	70	600	1200
SS-1 Scud A/B/SS-12 Scaleboard	300/900	300	600
SS-N-3 Shaddock	750	100	100
Short-range dual-capable aircraft ¹	various	1350	500
Medium-range bombers (TU-16, TU-22)	2900/5500	800	1600

¹ NATO aircraft include F-105D, F-4, F-111A/E, A-7D, and Buccaneer S2.
Warsaw Pact aircraft include SU-7 Fitter, MIG-21/23.

SOURCES: The Military Balance, 1973-74 (London: International Institute for Strategic Studies, 1973); Barnaby, Tactical Nuclear Weapons; Trevor Cliff, "Military Technology and the European Balance," Adelphi Paper 89 (London: International Institute for Strategic Studies, 1972); John M. Collins, American and Soviet Military Trends (Washington, D.C.: Center for Strategic and International Studies, 1978); James J. Martin, "How the Soviet Union Came to Gain Escalation Dominance: Trends and Asymmetries in the Theatre Nuclear Balance," in Uwe Nerlich, ed., The Soviet Asset: Military Power in the Competition over Europe (Cambridge: Ballinger Publishing, 1983).

own European "sphere of influence." These fears assumed a measure of credibility following a Brezhnev-Kissinger meeting in Moscow in April 1972. At the meeting Brezhnev proposed an agreement on nuclear weapon targeting which proscribed the employment of nuclear weapons against one another's home territory, thereby limiting the nuclear battlefield, in the case of NATO, to central Europe. Describing the incident, Kissinger wrote

[Brezhnev] asked to see me alone and suddenly introduced the idea of an "understanding" not to use nuclear weapons against each other. He called it a step of "immense significance," a "peaceful bomb." That it was.¹³⁷

Although the proposal was "politely turned aside," the potential development for such a condominium opened two courses of action to European, and in some cases American, defense officials. The first was the increased emphasis on strengthening the linkages of the NATO triad: conventional, theatre nuclear and U.S. strategic forces. Particular attention was placed on the theatre nuclear forces as NATO quietly acceded to U.S. proposals for their modernization, including the deployment of the dual-capable Lance missile and initial support for enhanced radiation weapon research and development.¹³⁸

The second course of action related to devising a more credible defense posture incorporating theatre nuclear forces to a greater degree than ever before into NATO's forward defenses. The Nuclear Planning Group (NPG) was

tasked with analyzing NATO's nuclear strategy. According to a NPG communique, the study was undertaken

...for the purpose of gaining deeper insight into policy matters pertaining to the defensive tactical use of nuclear weapons. This step, in turn, is expected to contribute to the further¹³⁹ refinement and elaboration of existing guidelines.

However, as late as 1975, the NPG had offered no substantive recommendations concerning the employment of tactical nuclear weapons. The principal recommendations revolved around a sort of "NATO C3": command, control and consultation procedures for European-based nuclear weapons. The June 1975 NPG meeting closed with a communique sounding much the same as the 1973 communique, although the defense ministers had altered their focus somewhat to deal with TNW employment in cases where initial use, in other words "demonstration bursts," had not achieved its purpose.

The pressure generated by European concern about US/NATO theatre nuclear doctrine and capabilities sparked a series of Congressional inquiries on the subject in the U.S. In May and June 1973 the Joint Committee on Atomic Energy conducted extensive hearings on the military applications of nuclear technology. Less than a year later the Senate Foreign Relations Committee held hearings on nuclear weapons and U.S. foreign policy. A few months earlier, in September 1973, the Senate Committee had published a staff report reviewing U.S. security issues in Europe, one of the main topics being European-based U.S. nuclear weapons.¹⁴⁰

The rash of Congressional investigations culminated on 5 August 1974 with the adoption of the Nunn Amendment to the DOD Appropriation Authorization Act of 1975, known as Public Law 93-365. The amendment directed the Secretary of Defense to study the overall concept for the use of TNW in Europe and its relation to deterrence and conventional defense. The Secretary was directed to report the results on or before 1 April 1975.

The Secretary's reply to the Nunn Amendment constituted an unprecedented release of previously classified DOD information and was the most thorough description of U.S. theatre nuclear force posture in Europe to date. The impact of SALT and elimination of U.S. strategic superiority was evident in the opening paragraphs of the report.

The threat of mutual annihilation limits the range of hostile actions which can be deterred by strategic forces and places more emphasis on the deterrent roles of theatre nuclear and conventional forces...Now, in the era of strategic equivalence, their importance has further increased. 141

With those forces in mind the document concluded that NATO had "a nuclear strategy and posture which is coordinated and overall is rational."

The text of the document, however, failed to support the Secretary's conclusions. It was no less ambiguous than MC 14/3, the NATO guidance which lay at the base of theatre nuclear posture questions in the first place. Schlesinger's report revealed that NATO's theatre nuclear posture was

seriously flawed and contained critical and exploitable weaknesses.

The most salient inconsistency in NATO's posture made obvious by the report centered on a crucial component of the Flexible Response strategy--the process of controlled escalation. In an apparent attempt to accommodate both U.S. and European views on the subject, the report merely served to amplify existing uncertainties. Initially the utility of theatre nuclear forces was attributed to their inherently lower escalation potential.

Theatre nuclear forces, because they do not pose a major threat to the Soviet homeland, constitute a retaliatory capability which carries a perceptively lower risk of escalation than the use of strategic nuclear forces.¹⁴²

However, several paragraphs later, the report states that "the first use of theatre nuclear forces, even in very limited ways, carries grave risks of escalation and should be considered only when the consequences of conventional defeat would be more serious."¹⁴³ This later phrase, so distinct from the first, reflected the DOD's attempts to reconcile European fears of U.S. intentions to fight a limited nuclear war in Europe with the U.S. requirement for a credible deterrent. West Germans in particular stubbornly adhered to the position that prospects for controlling escalation were, at best, dim. A West German Colonel summed up his country's viewpoint in two sentences:

Since the mechanism of escalation is uncertain, a limitation to the lowest level of destruction does not seem

possible. It is, therefore, essential to the Federal Republic of Germany that no tactical nuclear war whatsoever is fought on her territory.¹⁴⁴

Moreover, Schlesinger's strategy of controlled escalation depended heavily on conditions that no longer existed; U.S. and NATO nuclear superiority at virtually all levels of possible escalation. In other words, the ability to achieve "escalation dominance." NATO threats of escalation required survivable second-strike strategic and theatre nuclear forces capable of penetrating Soviet defenses to be effective. Aside from the erosion of U.S. numerical nuclear superiority, the actual vulnerability of one force (theatre nuclear) and the perceived vulnerability of the other (strategic nuclear) severely undermined Schlesinger's declaratory strategy of controlled escalation.

A second inconsistency in NATO's nuclear posture evident in the Secretary's report was NATO's failure to realistically account for Soviet military strategy in Europe. The Warsaw Pact's orientation toward nuclear operations and heavy, rapid armor assaults was adequately described. However, the report indicated that NATO theatre nuclear planning clearly disregarded, or at least downgraded, any notion that a major Soviet attack would most likely be meticulously prepared and certainly make allowances for some degree of NATO tactical nuclear employment.

By applying a potentially inappropriate Western cost-benefit framework, NATO tactical nuclear weapons were

supposed to dramatically "change the assessment of Warsaw Pact political leaders regarding early or cheap victory."¹⁴⁵ Little credence was given to the probability that the Soviet leadership did not anticipate a "cheap" victory and might well be prepared to wage a very costly war, in Western terms, in view of the prize at stake. Consequently, at the time of Schlesinger's report, both U.S. and European ideas about the initial use of tactical nuclear weapons were more or less convergent. Sounding much like the Secretary's report, the 1975/1976 West German White Paper indicated that the initial employment of nuclear weapons in Europe was "not intended so much to bring about a military decision as to achieve political effect."¹⁴⁶

Finally, Schlesinger's report made it clear that, in spite of the Soviet's offensive nuclear doctrine, NATO theatre nuclear force posture was based on NATO having the choice "to escalate or not to escalate," a vestige of the 1950s. Implicit throughout the report was the perception that NATO would be the regulator of qualitative force application. While it may have been true as late as the 1960s, by 1975 a credible Soviet theatre nuclear force and doctrine placed this conclusion in jeopardy.

None of the ambiguity and uncertainty so pervasive in the theatre force doctrine seemed to characterize US/NATO strategic nuclear doctrine. The Secretary of Defense's FY 1975 Defense Budget and Five-Year Defense Program

(1975-79), which preceded Schlesinger's theatre posture report to Congress only briefly, described the function of strategic nuclear forces in much more exacting terms than theatre nuclear forces. According to the FY 1975 report, the strategic nuclear arsenal included:

...forces to execute a wide range of options in response to potential actions by an enemy...while at the same time minimizing unintended collateral damage...the availability of carefully tailored, pre-planned options will contribute to that end.¹⁴⁷

In contrast, the tactical nuclear force description conveys considerably less clarity and confidence. The enigmatic nature of theatre nuclear warfare was unmistakable in the same 1975 report.

...as a practical matter, the initiation of a nuclear engagement would involve many uncertainties. Acceptable boundaries on such conflict would be difficult to establish...the decision to initiate the use of nuclear weapons--however small, clean, and precisely used they might be--would be the most agonizing that could face any national leader.¹⁴⁸

The impression given was that strategic nuclear exchanges could be carefully controlled, and limited, while employment of tactical nuclear weapons could not. The admonition "Acceptable boundaries on such a conflict [tactical nuclear] could be extremely difficult to establish" did not appear in the discussion of strategic nuclear warfare. The belief that strategic exchanges could be controlled and limited was incorporated into official U.S. defense doctrine in National Security Decision Memorandum (NSDM)-242 (January 1974), popularized by Schlesinger and later by

Secretaries Rumsfeld and Brown as a "countervailing strategy." The memorandum specified the possibility of employing land-based ICBMs on limited nuclear missions, so-called Limited Nuclear Options (LNOs), against the Warsaw Pact.

No equivalent or similar document existed for theatre/tactical nuclear forces; no such rung in the "escalation ladder." For reasons of intra-Alliance doctrinal incompatibility, NATO preferred to rely on an ad-hoc theatre nuclear strategy, as obscure to the Allies as it was to the Soviets.

Nonetheless, the revival of theatre nuclear thinking between 1971 and 1975 did generate initial answers to such questions as what was the contribution of theatre nuclear forces to deterrence? How did they relate to conventional forces? How could they be used? What modernization programs needed to be implemented?

The first tangible evidence of any real impact from the strategy reappraisal begun in 1971 was seen in the FY 1977 Secretary of Defense Annual Report, released 27 January 1976. The tone of the report was more confident and positive concerning the use of theatre nuclear weapons than the Annual Report of just two years earlier. The FY 1977 report reflected a maturing of U.S. strategic thinking and, simultaneously, a tacit admission of the declining efficacy of U.S. strategic forces. Unlike its predecessors, it stated in no uncertain terms that

NATO must be capable of executing effective nuclear attacks against Warsaw Pact military forces, with

discrimination and limited collateral damage, in response to major conventional or limited nuclear attack.

...and allow NATO to militarily exploit the use of nuclear weapons with conventional forces in order to bring about a termination/settlement of the conflict on terms which are advantageous to NATO.¹⁴⁹

In effect, the strategy transferred several of the missions of an increasingly ineffective strategic nuclear force to the more militarily useful theatre nuclear forces.

The Europeans were not slow to respond to the apparent shift in U.S. declaratory strategy. Less than a week after the FY 1977 Annual Report was issued publically, an article in the German Tribune, carried on the front page, gave U.S. defense officials notice that any change in NATO strategy along the lines prescribed in the new Annual Report would be met with opposition not unlike that which accompanied Flexible Response between 1960 and 1966.

The article in the German Tribune iterated the West German position quite clearly. In discussing the article, West German Army Colonel Klaus Reinhardt explained:

Since even a classic victory in central Europe would destroy everything we wish to maintain, our security policy must aim at preserving a situation of "non-war." Existing nuclear weapons are, therefore, not intended for actual use.¹⁵⁰

The West German White Paper published in 1976 was equally explicit. Beyond the possible initial use for political effect, "further escalation would mean that strategic nuclear weapons would be used against the attacker's own territory." As a war-fighting instrument, tactical nuclear

weapons were simply not considered by Europeans as part of the West's arsenal.

Caught in the middle of the trans-Atlantic debate was the Army, whose Field Manuals reflected the conventional emphasis of the Kennedy-Johnson-McNamara era while official guidance seemed to press for a more integrated conventional-nuclear doctrine in the European theatre. A rash of Field Manual updates during 1976-1977 reflected Army efforts to produce a revised tactical nuclear doctrine with greater emphasis on a combined arms approach to battle. The result, however, was a doctrine no more robust and effective than those which preceded it.

A. TACTICAL NUCLEAR DOCTRINE: IT'S NOT ALL IN THE PACKAGING

The period from 1971-1977 produced several attempts to establish new doctrinal guidelines for tactical nuclear employment. Considering the politico-military atmosphere within NATO at the time, it was not surprising that none provided definitive, well articulated guidance for the battlefield commander. The constraints of working within a framework which limited nuclear war was not a viable option eliminated most of the planning alternatives involving tactical nuclear weapons.

The bulk of the unclassified guidance focused on request-release procedures and described battlefield scenarios that gave NATO uncontested first choice of TNW employment. No effort was made to contend with a Soviet first-use

preemptive situation. The manuals failed to acknowledge that in any shooting war, the Warsaw Pact would be the aggressor and it, not NATO, might very well originate the "ground rules." Schlesinger's "Theatre Nuclear Posture" report to Congress had minimal impact on the Army's tactical nuclear doctrine revision process. Doubts about the Secretary's motives in proclaiming theatre nuclear war a "plannable" possibility and the longevity of such a philosophy within the Department of Defense were supported by the absence of any directive from the Office of the Secretary of Defense to the Army to incorporate tactical nuclear weapons into its war plans. As a result, the Secretary's report was interpreted not only as a document to inform Congress but rhetoric to influence Soviet perceptions of deterrence in a period of waning strategic nuclear credibility.

The event which did influence the Army's doctrinal revision process was the Arab-Israeli war in 1973. The July 1976 version of Army Field Manual (FM) 100-5, "Operations," claimed that "the war in the Middle East might well portend the nature of modern battle."¹⁵¹ The war confirmed the Army's high-tempo, short-war concept and made clear the lethality of modern conventional weapons. The lessons learned from the war, valid as far as they went, did not take into account that (1) neither side was equipped with tactical nuclear weapons or (2) even had they been so

equipped, the ability of the Arabs or Israelis to absorb multiple nuclear blows and survive was considerably less than the analogous situation in Europe and that alone might have served as a strong deterrent to nuclear use.

Prior to the 1973 war and Schlesinger's report the Army published an interim manual on Tactical Nuclear Operations, FM 100-30 (Test). Although the manual was never published in final form or officially approved for distribution, it reflected a significant departure from earlier Army thinking embodied in FM 100-31 (1951). FM 100-31 envisioned the widespread use of battlefield atomic weapons but no major changes in offensive doctrine. FM 100-30 (Test), on the other hand, spoke of a complex transition from conventional to nuclear operations in which "the combatants must practice some degree of arms control and must refrain from actions that encourage escalation."¹⁵² While the older FM 100-31 adopted a war-fighting position with credible use of nuclear weapons, FM 100-30 (Test) was more concerned with the political difficulties of employment. In short, it provided no war-fighting doctrine for the nuclear battlefield.¹⁵³

The philosophy contained in FM 100-30 (Test) was carried over into 1976-1977 field manual revisions. In spite of statements in the newly revised manuals to the contrary, actual attempts at integrating conventional and nuclear weapons on the battlefield were illusory and the two remained as distinct as oil and water.

The 1976 version of FM 100-5 related that, with the development of accurate tactical nuclear weapons, "the pendulum has swung from conventional war to nuclear war and now to the present concept of conventional-nuclear war."¹⁵⁴ Similarly, an opening note to the user described FM 6-20, "Fire Support in Combined Arms Operations," as a new manual which illustrated how to integrate all fire support, direct and indirect, into combined arms operations. However, the cursory attention devoted to tactical nuclear doctrine in FM 6-20 revealed no intention of developing a truly combined arms approach to the battlefield. The entire section on Tactical Nuclear Doctrine, reprinted below, was characterized by its brevity and shallow guidance it provided the reader.

Tactical Nuclear Doctrine

U.S. Army tactical nuclear doctrine describes the methodology for employment of nuclear weapons on the battlefield and for conducting operations in a nuclear conflict. For the purposes of this chapter, tactical employment means the use of nuclear weapons by the battlefield commander--usually at corps or below--in support of maneuver forces in his command.

Because nuclear weapons represent combat power of tremendous magnitude, the initial use of nuclear weapons will result in a significant change in the nature of any conflict. While tactical nuclear planning by the corps will be oriented toward the achievement of tactical goals, any employment of nuclear weapons will have a fundamentally political aspect of which planners at all echelons must be aware. Whether nuclear weapons should be used during a given conflict and the degree of their use are strategic decisions that high level political/military authorities will make.

The Army's tactical nuclear doctrine specifies the manner in which corps and divisions will conduct nuclear operations within political and military constraints. Such

constraints may include geographical or political boundaries, yield limitations, time, number of weapons to be used, collateral damage preclusion guidance, and restrictions on using specific delivery systems or attacking specific types of targets.¹⁵⁵

Both field manuals, 100-5 and 6-20, contained separate chapters on Offensive and Defensive operations. In more than 180 pages of discussion and description in these chapters, tactical nuclear weapons were not mentioned. The chapters were oriented entirely toward conventional operations. The chapter in FM 100-5 titled "Tactical Nuclear Operations" described nuclear weapon effects, nuclear weapon packages and control of nuclear release but not operations. Another 16-page chapter devoted to operations within NATO mentioned nuclear weapons only in a peripheral sense related to battlefield command and control.

The most dramatic change in procedure and doctrine indicated in the revised manuals was the adoption of the "nuclear weapon package." A package was defined as "a group of nuclear weapons of specific yields for employment in a specified area, within a limited timeframe to support a tactical contingency."¹⁵⁶ A corps nuclear weapon package was foreseen as consisting of between 100 and 200 weapons.

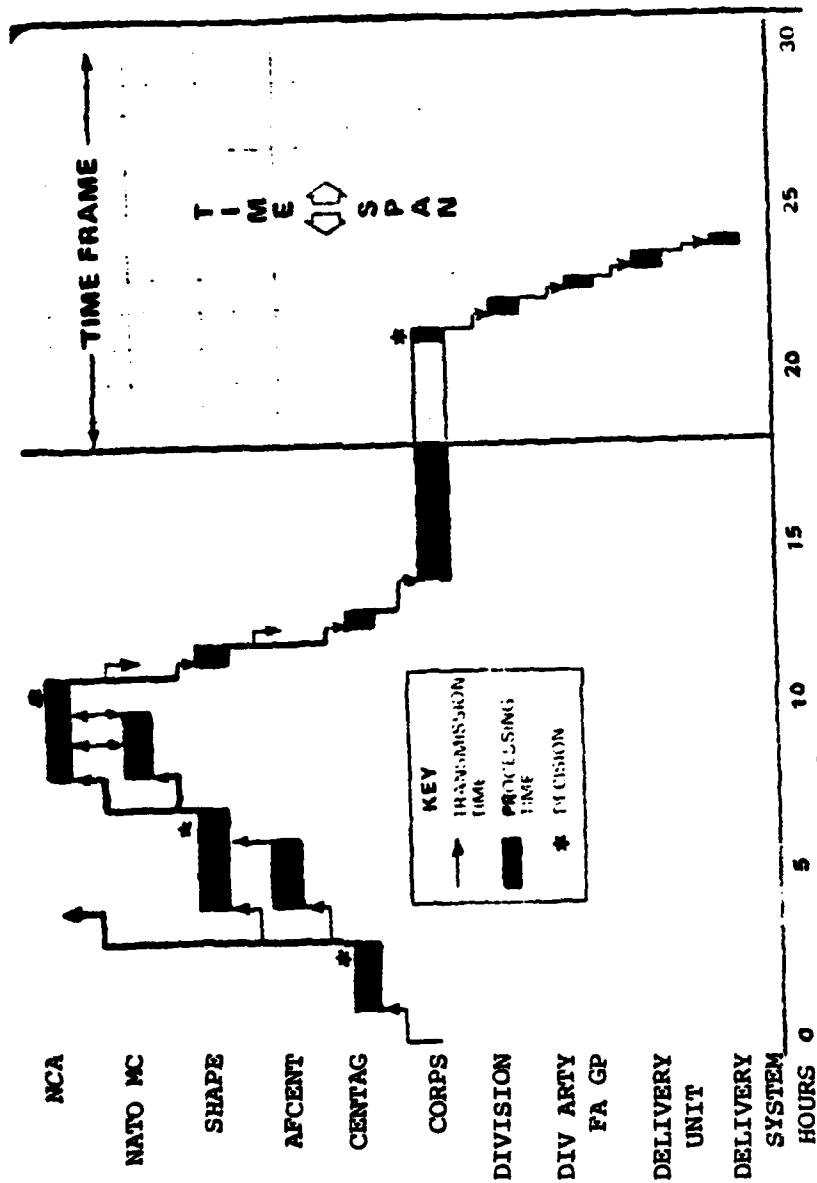
The nuclear weapon package concept created and was accompanied by an array of problems and obstacles to effective in-theatre nuclear weapon use. First, discussion of the package and its application in the Field Manuals was vague and made no reference to specific weapon systems. No

substantive mention was made of aircraft delivered weapons (the Forward-Based Systems) or missiles (Honest John, Lance, or Pershing). The emphasis throughout all package descriptions implied a nuclear artillery barrage only. Although precise elaboration of specific weapon systems was impossible in these unclassified manuals, the relevant FMs contained less information and guidance about tactical nuclear weapon employment than Schlesinger's 1975 report to the Congress.

A second problem with the nuclear weapon package as it existed was the requirement for each package to be treated as a separate entity for the purpose of request and release. While the on-scene commander could use fewer weapons than allocated in a particular package, he was under pressure to expend the entire package to achieve maximum effect, not knowing if a follow-on package would be released in time to be tactically useful. The request-release sequence was estimated to take approximately 18-24 hours from corps request to corps receipt of release. Another 6 hours were expected to pass before physical weapon firing. Figures 1 and 2, from FMs 100-5 and 6-20 respectively, graphically displayed the lengthy procedures involved.

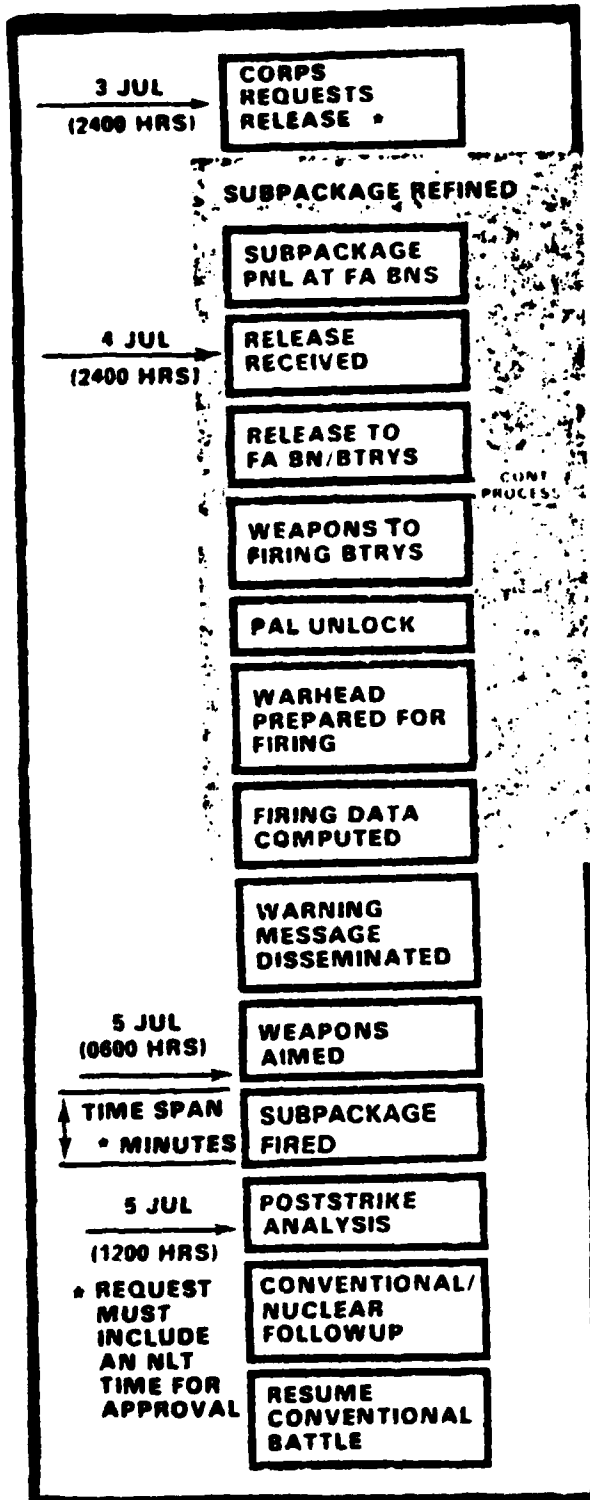
In addition, the on-scene commander was required to work within a very restrictive employment window and had only marginal leeway to modify the firing and targeting plans. All weapons in the package were to be fired in the "shortest possible time span." The guidance in FM 100-5

FIGURE 1: BATTLEFIELD NUCLEAR WEAPON REQUEST-RELEASE SEQUENCE



SOURCE: FM-100-5, p. 10-9.

FIGURE 2: EVENTS FOLLOWING RELEASE REQUEST



Legend

PNL--Prescribed Nuclear Load
 FA--Field Artillery
 BN--Battalion
 BTRY--Battery
 PAL--Permissive Action Link
 NLT--No later than

SOURCE: FM 6-20, p. 6-39.

directed that "all nuclear weapons will be employed as a 'pulse' within a shorter timespan, normally expressed in minutes."¹⁵⁷

To make matters worse, the instructions describing situations which warranted nuclear weapon request were confusing and often contradictory. The Army manual devoted to tactical nuclear operations, RB 100-30, "Tactical Nuclear Operations-Doctrine," illustrated the problem.

Unless the enemy uses them first, nuclear weapons will not be authorized before conventional defenses have been severely tested and found inadequate. The situation facing the corps at the time nuclear weapons are requested must therefore be grave--under sustained attack by superior forces, own forces becoming fully committed and not likely to hold, reinforcements not available, insufficient combat support and combat service support available to sustain the defense, and the survivability of the force in question.¹⁵⁸

The situation which was to exist before requesting nuclear weapons release was fairly explicit. However, that same corps commander, faced with the ominous situation outlined above and knowing it might take up to 24 hours from actual request to physical weapon release, had to apply additional criteria before executing his request.

One of the criteria to be followed by the corps commander in requesting release of nuclear weapons is that the corps defensive capability must not be allowed to deteriorate to the point where the corps could not defend conventionally. After the release and execution of the nuclear strike, the corps must have sufficient forces available to conduct a conventional, forward defense against the remaining enemy forces.¹⁵⁹

The dichotomies were obvious. First, the corps commander was not to allow his defensive capability to

deteriorate "to the point where the corps could not defend conventionally." Yet the scenario which prescribed the request of nuclear weapons was one which fit, or would shortly, that very description. Second, a corps commander whose force survivability was in question was nonetheless supposed to have sufficient forces remaining 24 hours later to conduct a "conventional forward defense." Finally, even though reinforcements were not available and there was insufficient combat support and service available, nuclear weapon packages would somehow make their way to the front and into the commander's hands!

The guidance was procedural, not tactical. It provided information to facilitate a decision on whether or not the situation called for nuclear weapons. The combination of pressures to expend the entire package, the extremely narrow timeframe for employment, and inadequate request guidance severely hampered the corps commander's flexibility. Together they precluded effective real-time use of tactical nuclear weapons in the rapidly changing environment of a high-tempo, predominantly armored, Warsaw Pact assault. The guidance provided was limited to a situation which was already on the verge of being lost and tactical nuclear weapon employment would most likely be too little too late. As designed and administered the nuclear weapon package could only have been effective if the Soviet's attack was slow, conventional and conformed to prehostility planning

conceptions. In reality, the package was structured more to fit the West German's conception of "political application" than to impart any military utility to the weapons.

The ten-year phase of tactical nuclear doctrine development, extending from 1968 to 1977, was thus a dismal failure. Compared with the aggressive doctrine of the 1950s, tactical nuclear doctrine in 1977 was less integrated into the overall NATO defense structure. Hastening conflict termination, referring to some sort of return to a status quo ante, and not victory became one of the primary functions of tactical nuclear weapons.

Finally, the DOD FY 1977 Annual Report claimed that U.S. military strength had dropped to "600,000 below 1964 levels, while opposing military capabilities have grown quantitatively and qualitatively."¹⁶⁰ In Europe this was evident in the number of U.S. troops stationed in West Germany which had declined to 4 divisions and 3 maneuver brigades in West Berlin. While defense officials and politicians in Europe and the U.S. discussed, bemoaned and feared the growing imbalance in nearly all NATO-Warsaw Pact military indicators, no action was undertaken to devise a more credible and integrated strategy with NATO conventional and nuclear forces "in-being." Within the Alliance solutions focused on more equitable defense burden sharing. Outside of NATO itself, alliance leaders looked toward arms control, particularly SALT II and the Mutual and Balanced Force

Reduction (MBFR) negotiations, as a panacea for its
strategic ills.

VI. DECISIONS, DECISIONS, 1978-1984

Deterrence is not, and cannot be, bluff.

President's Commission on Strategic Forces¹⁶¹

It is against the background of bankruptcy in U.S./NATO tactical nuclear doctrine that two of NATO's most important and controversial nuclear related decisions must be viewed: President Carter's April 1978 decision to defer production of the enhanced radiation warhead (ERW) and the implementation, beginning in December 1979, of a long-range theatre nuclear force (LRTNF) modernization and deployment program. Both decisions generated unprecedented public involvement in and opposition to NATO's nuclear strategy in Europe and the United States. Adding fuel to the opposition's fire was the European's pervasive lack of confidence in Carter as a leader of the Western Alliance. His abrupt reversal, following events in Afghanistan in 1979, of what many considered too soft a stance toward the Soviet Union reinforced European perceptions of an uncertain and insecure American President.

In the case of the enhanced radiation warhead, the opposition strongly influenced Carter's decision to defer production, with Carter fearing his Administration "would be stamped forever as the Administration which introduced bombs that kill people but leave buildings intact."¹⁶²

The LRTNF program, originally a European proposal which the United States only halfheartedly endorsed, has come under heavy attack by "peace-niks" and politicians alike throughout Europe. Although the initial stages of the LRTNF deployment proceeded as scheduled beginning December 1983, development of acceptable employment strategies will be incredibly difficult in the wake of a widely supported and influential European anti-nuclear movement.

The ERW debacle began 4 June 1977 when the Washington Post broke the story "Neutron Killer Warhead Buried in ERDA Budget."¹⁶³ The article was accompanied by an editorial which claimed the ERW was a weapon that the military would view "as being sufficiently small, safe and controllable to be used without fear of starting a general nuclear war." The Post's story kicked off a heated debate in the Senate and a spate of often factually distorted editorials in the U.S. and overseas. President Carter assumed the offensive, supporting the production and deployment of the ERW in an 11 July letter to Senator John Stennis and during a nationally televised press conference the next day. During the press conference Carter stated that the ERW "ought to be one of our options in the nuclear weapons field." Shortly thereafter, and in spite of his positive endorsement, Carter bowed to growing pressures to defer a final production decision pending additional study.

The debate in Europe initially mirrored the polarization of proponents and opponents of the ERW in the United States. The opposition was particularly vocal in West Germany, led by Social Democrat Egon Bahr. A close advisor to SPD Chairman Willy Brandt, Bahr melodramatically declared the ERW to be "a symbol for the perversion of human thinking."¹⁶⁴ West German Chancellor Helmut Schmidt remained noncommittal, awaiting further clarification of the weapon's impact on East-West relations and the arms control process.

By the spring of 1978 the ERW had weathered several House and Senate attempts to eliminate funding and the swell of opposition had fallen off to a ripple. Schmidt assured Carter that West Germany would accept the ERW if another NATO country did the same. French President Giscard d'Estaing publically supported deployment while several other uncommitted NATO-Europe countries appeared "persuadable."¹⁶⁵

Amidst slowly growing support, Carter abruptly reversed course. On 3 April the New York Times reported that Carter had decided against producing the ERW. Supporters of the weapon, including former President Gerald Ford, urged Carter to implement production. West German Foreign Minister Hans-Dietrich Genscher met with Carter on 4 April to relay his government's favorable disposition on deployment. The meeting with Genscher changed nothing and on 7 April Carter issued a statement which essentially killed the ERW issue for his Administration.

I have decided to defer production of weapons with enhanced radiation effects. The ultimate decision regarding the incorporation of enhanced radiation features into our modernized battlefield weapons will be made later, and will be influenced by the degree to which the Soviet Union shows restraint in its conventional and nuclear arms programs and force deployments affecting the security of the United States and Western Europe.¹⁸⁶

The European governments politely issued statements endorsing Carter's decision. The leading West German opposition parties, probably reflecting true government opinion, uniformly touted the decision as sending a weak and dangerous signal of U.S./NATO resolve to the Soviets. The Christian Democratic Union (CDU) warned that Carter's decision had placed European confidence in the United States in jeopardy. Likewise, the Christian Social Union (CSU) claimed Carter's action raised serious doubts about his leadership capabilities. From London, the Tories called the decision a major propaganda victory for the Soviet Union. In the words of Carter's national security advisor, the entire affair became "a major setback in U.S.-European relations."¹⁶⁷

At no time did the debate center on the military utility (or non-utility) of the enhanced radiation warhead. Only after the Post's disclosure in June did Carter order a DOD study of the weapon. At his direction even this study was oriented less toward combat employment potential than the impact of ERW production and deployment on arms control negotiations, particularly SALT II. Not until September,

three months after the issue surface publically, was a DOD team dispatched to Europe to discuss the ERW and solicit the views of the allies.

During the Senate debate proponents of the ERW avoided discussion of the weapon's positive design characteristics of reduced blast and reduced residual radiation, choosing instead to focus on the deterrent and force modernization requirements. Testimony by Senator Sam Nunn (Democrat-Georgia), one of the weapon's more ardent supporters, summed up the pro-ERW argument.

Those who oppose the warhead apparently believe in self-deterrence; that is to say, that we should keep the weapons so destructive we would never use them or if we did use them, it would be only under the most desperate of conditions. The fault with this argument is that if the Soviets perceive this to be our posture, then deterrence is weakened...we encourage the very war we seek to avoid.

If we do not have usable weapons, then we do not have deterrence, and if we do not have deterrence, then we may end up being forced to use unusable weapons or to capitulate. We must not invite the very aggression we seek to deter.¹⁶⁸

The opposition, on the other hand, harped on the immorality of a conscious decision to employ a radiation-killer weapon and the need to maintain the distinct "fire-break" between conventional and nuclear war, a concept they believed the ERW would blur. Senator Dick Clark (Democrat-Iowa) repeatedly claimed that "the introduction of supposedly 'clean' weapons, the illusion of some sort of benign nuclear exchange, threatens to blur that distinction, and

as such is potentially a dangerous trigger to nuclear holocaust."¹⁶⁹ Fellow ERW opponent John Heinz (Republican-Pennsylvania) went so far as to compare the enhanced radiation warhead with the horrors of chemical warfare. He noted that "it is bad enough that this weapon seems akin to chemical warfare, not only because it targets people rather than property, but because it will subject them in many instances to excruciating death by radiation."¹⁷⁰

These accusations were backed by no empirical evidence. The Senator's moral discourse against the ERW could just as well have been directed toward the existing tactical nuclear arsenal in Europe. Cast in the context of a comparison with those fission weapons, it is impossible to conclude that the ERW is immoral while fission weapons are not. The mere fact that ERW opponents used the "radiation-kill" as a supporting argument for their position reflected just how ill-informed they really were. Even before the enhanced radiation warhead the Army considered radiation the primary kill mechanism of a low-yield nuclear weapon against protected personnel, a fact well documented in numerous Army field manuals.¹⁷¹

One problem which contributed to the lack of informed Congressional debate was the fact that the Army, sole benefactor of any ERW production, remained strangely silent. It was to receive the only enhanced radiation warheads, the W70-3 for the Lance missile and the W79 for the 8-inch

howitzer, sorely needed to modernize their aging nuclear arsenal. The Army's quiescence can be attributed to a combination of (1) a lack of understanding of the potential military applications of the ERW weapon and (2) its surprise at the outrage over what it considered a simple modernization program.

In fact, Army support for the ERW came only after the original DOD preference for incorporating new warheads based on "old" fission technology was rejected by the Joint Commission on Atomic Energy (JCAE). According to S.T. Cohen, father of the enhanced radiation concept, "had the JCAE given its approval to production of these fission warheads originally requested by the Army, it seems doubtful that enhanced radiation warheads would have received serious consideration."¹⁷²

Carter's 7 April decision to defer ERW production quickly fell from the list of central defense issues in the wake of the hostage crisis in Iran and the Soviet invasion of Afghanistan. His promise of an "ultimate decision" on the weapon, to be influenced heavily by Soviet restraint in defense-related programs, was apparently forgotten or ignored. In the period between the April 1978 decision and the November 1980 election of Ronald Reagan, the Soviets deployed more than 100 SS-20 nuclear missiles against Western Europe and added approximately 70 Backfire bombers to their inventory. Conventional armament programs reflected similar

increases. Fighter aircraft, helicopter, tank, armored vehicle, towed artillery and multiple rocket launcher production were at higher levels in 1980 than 1978.¹⁷³

The LRTNF program established in 1979 is viewed in a completely different light than the enhanced radiation warhead by government officials on both sides of the Atlantic. Soviet deployment of the SS-20 nuclear missile, coupled with President Carter's failure to act on the ERW issue to demonstrate American leadership of NATO nuclear strategy, generated pressures for a revitalization of the traditional U.S./NATO nuclear linkages.

These pressures were accentuated by widespread criticism of the SALT II negotiations. According to European observers, a critical analysis of the SALT II process reveals four serious dangers to Western security, three of which are directly related to the European theatre nuclear balance and NATO's strategy of flexible response.

- (1) The credibility of the U.S. strategic nuclear guarantee has been impaired;
- (2) Grave imbalances at the so-called Eurostrategic level have been aggravated by SALT II;
- (3) The consequent and imperative quest for theatre nuclear modernization may be hindered by SALT II;
- (4) U.S. behavior in SALT II provides little warrant for confidence that further SALT negotiations will produce favorable results.¹⁷⁴

Finally, there is a subtle, but very important, distinction between the ERW debate and the LRTNF modernization

and deployment program. In the ERW debate nearly all the political participants in the United States, supporters and opponents alike, structured their arguments around the fundamental premise that limited nuclear war was a non-sequitur. No one appeared to doubt the inevitability of uncontrolled escalation once nuclear weapons were employed. Rather, differences arose in defining what type of nuclear force constituted the most credible deterrent to war; a force designed for warfighting or one designed for punishment. The enhanced radiation weapon conveniently embodies popular preconceived notions about limited nuclear war. Design characteristics of high accuracy, low-yield and reduced collateral damage make it a useful nuclear warfighting instrument. The bulk of the criticism of the LRTNF program, however, has revolved around questions of political need to respond to changes in the European theatre nuclear balance, political viability of the deployment, and its arms control implications. The LRTNF weapons, Pershing II and Ground Launched Cruise Missiles (GLCM), are of much higher yield than ERW warheads and have been billed exclusively as a deterrent force.¹⁷⁵ As a result, nuclear warfighting has not been a critical issue in the deployment debate. The controversy surrounding the LRTNF program has been considerably more rational and much less emotional than the highly charged ERW debate.

So that the Administration's intentions would not be misconstrued, the State and Defense Departments have gone to

great lengths to make the deterrent nature of the LRTNF program clear. Speaking before an audience in Brussels, Richard Burt, the State Department's director of Politico-Military Affairs, explained that the deployment "does not represent a step toward the development of a NATO nuclear warfighting capability...This deployment will force on [the Soviet Union] the realization that NATO will not fight a war on their terms."¹⁷⁶

From the outset, the GLCM/Pershing II deployment has been a decision lacking a vigorous strategic foundation. The number of weapons and basing modes selected have neglected important military considerations and have been determined largely by political criteria and intra-Alliance compromise. A striking parallel exists between the 1957-59 deployment of the long-range Thor and Jupiter missiles and the 1979 NATO LRTNF decision. Both were devised to correct a decline in the confidence of U.S. strategic nuclear forces and simultaneously offset a Soviet theatre nuclear threat. Although written in 1962, a change in dates and missile names would make the following statement virtually indistinguishable from any written in the last three or four years.

In 1957-58 the NATO Council resolved to station American IRBMs in Europe. This decision was made under the impact of the Soviet long-range missile potential and was designed to offset it. This was duly implemented by the stationing in Britain of Thor, and in Italy of Jupiter... Other European members of NATO refused to station such missiles on their territory and others were not considered for either military or geographic reasons. The main political motive behind this undertaking was doubtless to

restore the diminished confidence of European governments, in the efficacy of the strategy of massive retaliation.¹⁷⁷

The December 1983 deployment of the Pershing II and GLCM is viewed in similar terms as (1) a means of "recoupling" the U.S. to West European security and (2) a deterrent response to the Soviet SS-20 missile. Comparison of the 1984 DOD Annual Report description of the LRTNF modernization and Schmidt's statement above is disconcerting, giving the impression that NATO nuclear strategy has made little headway in 20 years.

The Soviet Union...has been engaged since 1977 in a significant buildup of its LRINF arsenal with deployments of the MIRVed SS-20 ballistic missile...

The Soviet buildup led to concern throughout the NATO alliance that a perceived gap had been created in NATO's spectrum of nuclear deterrence. The fear was that the Soviets might believe--however incorrectly--that they could conduct or threaten limited strikes against Western Europe from a sanctuary in the Soviet Union, on the assumption that, without strong theatre-based systems capable of reaching Soviet territory, and given the loss of U.S. strategic superiority, NATO lacked an appropriate means of response. The December 1979 Alliance decision authorizing deployment of the Pershing II and GLCM... represented NATO's efforts to redress this imbalance.

...Construction of GLCM bases is under way in the United Kingdom and Italy, and preliminary GLCM basing preparations have begun in the Federal Republic of Germany.¹⁷⁸

Throughout the 1960's and early 1970's politicians and military men in the West were well aware that the American strategic nuclear edge was rapidly dissipating. Even though SALT I had the effect of readily distinguishing between strategic and theatre weapons and codified a superpower nuclear balance in strategic systems as early as 1972,

widespread realization of parity took an additional six years. Suddenly, in 1977, there was a pressing need to address the SS-4/5 and growing SS-20 theatre arsenal of the Soviets.¹⁷⁹

In July 1977 President Carter called for the modification of NATO theatre nuclear forces, "especially in support of NATO's deterrent strategy of flexible response."¹ and a half years later, when the NATO defense ministers announced their LRTNF modernization program, Soviet long-range (greater than 1000 kilometers) theatre nuclear forces poised at Europe included over 2000 "ready-to-warheads. Comparable NATO systems included no long-range missiles, 56 aging British Vulcan bombers and 156 U.S. F-111E/F bombers. Table 2 outlines the LRTNF balance at the time of the NATO minister's December 1979 decision and the situation prior to the December 1983 Pershing II/GLC deployment.

The NATO Nuclear Planning Group (NPG) took charge of modernization plans shortly after Carter's July statement. The NPG created two subgroups. The High Level Group would accomplish a complete review of the theatre nuclear balance and prepare deployment plans. The Special Consultative Group (SCG) would investigate the arms control political considerations involved in the modernization and set guidelines for arms control talks.

TABLE 2: UNITED STATES/NATO AND SOVIET UNION LAND-BASED LONG-RANGE
THEATRE NUCLEAR SYSTEMS DEPLOYED IN EUROPE IN 1979 AND 1983*

Soviet Union System (IOC)	1979 Launchers/ Missiles ¹	War heads	1983 Launchers/ Missiles	War heads	Range (km)
SS-20 (1977)	110/220	660	243/486	1458	5000
SS-4/5 (1959-61)	450/450	450	380/380	380	2000/4100
TU-22M Backfire (1974)	60/4	240	95/4	360	5500
TU-16 Badger (1955)	300/2	600	575/2	1150	3100
TU-22 Blinder (1962)	135/2	270			2900
United States/NATO					
Land-based missiles	0	0	0	0	NA
F-111 E/F (1967)	156/2	312	156/2	312	1800
UK Vulcan B2 (1960)	56/2	112	0 ²	0	1200
UK Buccaneer (1962)	50/2	100	20/2	40	(915)
France					
SSBS-2/3 (1971)	18/18	18	18/18	18	3000
Mirage IVA (1964)	33/1	33	33/1	33	(800)

¹Number refers to number of bombs carried when aircraft are specified.

²The British Vulcans have been "denuclearized" in preparation for the aircraft's retirement.

*Adapted from Gregory Treverton, Nuclear Weapons in Europe, pp. 31-84; Anthony Cordesman, "Europe's Quiet Profile in Courage," Armed Forces Journal International, June 1981, p. 38; Donald Cotter, James Hansen and Kirk McConnell, "The Nuclear Balance in Europe: Status, Trends, Implications," USSI Report 83-1 (Washington, D.C.: United States Strategic Institute, 1983, pp. 23-42.

The bifurcation of responsibilities by the NPG eventually evolved into the December 1979 "dual-track" decision; parallel deployment plans and preparations for the Pershing II and GLCM, scheduled to begin in December 1983, preceded, and if necessary followed, by bilateral U.S.-Soviet arms limitation negotiations. Inherent weaknesses and inconsistencies have since plagued each "track," however, leaving the impression that the inputs of the HLG and SCG were incorporated separately by the NATO defense ministers into the modernization program with little attention paid to their combined effects on the program's final appearance.

This conclusion is supported by the fact that the two groups met together only once, 28 September 1979. Shortly thereafter a draft integrated decision was prepared by HLG chairman David McGiffert, U.S. assistant secretary of defense for international security affairs, and presented to the North Atlantic Council on 6 November. It was approved on 28 November and announced in a NATO Communique on 12 December 1979. The position adopted by the defense ministers suggests that military (i.e., warfighting) considerations were more of an afterthought than a serious area of concern throughout the LRTNF program development. This is particularly evident in the HLG's arrival at a deployment figure of 572 weapons and the SCG's arms control approach.

An initial range of 200-600 missiles was proposed by the United States. It was felt more would be provocative

while less would send too weak a signal to the Soviet Union. Equality was dismissed as defeating the very purpose of the deployment. "To equal the Soviet force numerically...could have a 'decoupling' effect, as it could imply no need to escalate to American strategic forces, and could thus threaten to limit a war to Europe."¹⁸¹

As a result, the decision to deploy 572 weapons was determined by internal NATO politics and preconceived notions of dealing with the Soviets in future arms control negotiations. The decision did not encompass tactical employment or targeting considerations because the weapons were not instruments of war, but a deterrent force. In short, the planned deployment had to provide a sufficiently credible deterrent against the Soviet long-range theatre forces to offset their existing escalatory advantage and bring them to the negotiating table while at the same time reassuring allies that the U.S. had no intentions of fighting a limited nuclear war on European soil.

In a similar fashion, the SCG's arms control recommendations were directed more toward making the deployment decision more palatable to European domestic constituencies than achieving real bargaining leverage at any negotiations. In conjunction with the deployment of 108 Pershing II and 464 GLCMs, the ministers announced a reduction of 1108 nuclear warheads stockpiled in Europe. One thousand warheads would be removed from the short-range stockpile plus the

removal of the 108 Pershing 1A to be replaced by the Pershing

II. As stated in the NATO minister's 12 December 1979

Communique,

The program will not increase NATO's reliance upon nuclear weapons. In this connection, Ministers agreed that as an integral part of TNF modernization, 1,000 U.S. nuclear warheads will be withdrawn from Europe as soon as feasible. Further, ministers decided that the 572 LRTNF warheads should be accommodated within that reduced level, which necessarily implies a numerical shift of emphasis away from warheads for ¹⁸²delivery systems of other types and shorter ranges.

The intent appears to have been to portray the LRTNF as a positive tradeoff of "usable" short-range systems for a more stable, deterrent force of long-range systems, thus further reducing the prospect of limited nuclear war. In the process, however, the Army was losing a valuable mid-range weapon, the Pershing 1A, and gaining a weapon with a completely different role. The relative scarcity of the Pershing II, its long-range characteristics, and high yield (selectable 60-250 kiloton) precludes any battlefield or second echelon role similar to that of the shorter range Pershing 1A. This leaves the Army the 110 kilometer Lance dual-capable missile as the longest range nuclear asset under its own control.

The focus on longer-range systems has diverted much needed attention away from and obscured the importance of the more prevalent shorter-range systems. More than 75 percent of NATO's nuclear arsenal is composed of weapons with less than a 300 kilometer range. Nearly 60 percent

of the Soviet theatre nuclear arsenal consists of similar systems. Table 3 outlines the short-range nuclear balance in mid-1983.

Of all the available nuclear systems, these weapons truly deserve the title "grey area weapons." They are neither restricted by arms control agreements nor a direct part of any ongoing negotiations. Any formal arms control agreement limited to long-range systems risks spurring an expansion of the shorter range arsenals. The recent growth of such Soviet systems, SS-21, 22 and 23, already portends a serious imbalance in theatre nuclear weapons excluded from the Geneva INF talks.

A. FLEXIBLE RESPONSE REVISITED

These trends have not gone unnoticed by the European public. The LRTNF debate has educated people and increased their awareness of the dangerous uncertainties dominating NATO's nuclear deterrent strategy. Poor representation by NATO about how it intends to use theatre nuclear weapons, short and long range, in conjunction with its inferior conventional forces has fueled justifiable doubts as to the effectiveness of NATO's overall defense posture.

The absence of American leadership and initiative in the nuclear realm has contributed significantly to doubts. The newly emerging East-West military balance requires not only a deterrent philosophy but innovation in strategic thinking and a credible warfighting defense concept. Neither have

TABLE 3: UNITED STATES/NATO AND SOVIET UNION LAND-BASED SHORT-RANGE THEATRE NUCLEAR SYSTEMS DEPLOYED IN EUROPE (LESS THAN 1000 KILOMETERS)

Soviet Union System (IOC)	1983 Launchers/ Missiles ¹	Estimated Yield	Range (km)
Nuclear-capable Artillery (1955-83)	215/432	10kt	30
SS-21 Frog (1957-65)	630/2520	50kt	120
SS-23 Scud (1981)	554/1108	100kt	300
SS-12/22 Scaleboard (1969-1981)	100/200	1MGT	900
SU-7 Fitter A (1959)	165/1	?	450
SU-17 Fitter C/D (1974)	740/2	?	540
SU-19/24 Fencer (1974)	480/2	?	640
MIG-21 Fishbed J/N (1970)	750/1	?	415
MIG-27 Flogger D (1971)	500/1	?	830
United States/NATO			
Nuclear-capable Artillery (1962-64)			
155mm/203mm	1912/2000	1-2kt	30
Honest John	54/324	20kt	40
Lance (1971)	98/588	1-50kt	110
Pershing 1A (1962)	180/270	60-400kt	740
Jaguar (1972)	80/1	10-25kt	400
F-104 (1958)	288/1	100kt	600
F-4E (1962)	174/1	100kt	620
France			
Pluton (1974)	42/84	20kt	120
Mirage III (1972)	30/1	10-25kt	600

¹ Number refers to number of bombs carried when aircraft are specified.

Adapted from Trevorton, Nuclear Weapons in Europe, pp. 31-34; Cotter, Hansen and McConnell, "The Nuclear Balance in Europe," pp. 23-42; Porro and Olive, Nuclear Weapons in Europe, pp. 68-70; Barnaby, Tactical Nuclear Weapons, pp. 110-136; North Atlantic Assembly's Special Committee on Nuclear Weapons in Europe, Second Interim Report on Nuclear Weapons in Europe, Report to the Committee on Foreign Relations, U.S. Senate, 98th Cong., 1st session (Washington, D.C.: Government Printing Office, 1983) p. 59.

materialized in official U.S. statements or literature. As the gap between NATO and Warsaw Pact conventional and nuclear forces widens, the utility of theatre nuclear forces in NATO's declaratory strategy has become increasingly nebulous. In 1979, Secretary of Defense Harold Brown claimed that "the U.S. theatre nuclear forces have a symbolic importance that transcends their direct military value. They are the visible linkage between our deployed posture and the strategic nuclear forces."¹⁸³ A similar remark in the West German 1979 White Paper claimed that the essential equivalence of NATO-Warsaw Pact nuclear potential was the result of the "conceptual and structural interlinkage of the central strategic forces of the United States with the nuclear forces in Europe."¹⁸⁴

The Department of Defense Annual Report for FY 1981, written under the auspices of then Secretary of Defense Harold Brown, outlines five steps to deal with the theatre nuclear dilemma. In brief, these steps are:

- (1) modernize and protect tactical nuclear weapon command and control capabilities;
- (2) develop mobile missiles, in particular Pershing II and GLCM;
- (3) deploy the Pershing II and GLCM;
- (4) outline an arms control approach to LRTNF;
- (5) withdraw 1000 nuclear warheads from Europe.¹⁸⁵

None of the measures are remotely related to developing an employment doctrine or guidelines. While physical

deployment of the weapons and arms control measures receive high priority, no mention is made of what to do with the weapons in time of crisis. The most significant mention of short-range systems is to reduce the arsenal by 1000 warheads, not how to employ the remaining 6000!

A year later, amidst voluminous literature highlighting the theatre nuclear weapon problem, Secretary of Defense Casper Weinberger perpetuated the tradition of short-sighted tactical nuclear thinking and reinforced the image of tactical nuclear weapon non-utility. Assured his predecessor's five steps to correct the problems were in progress, he defined the "purpose" of nuclear forces:

- (1) to deter nuclear attack on the United States and its allies;
- (2) to deter conventional attack on the United States and its allies;
- (3) to deter escalation of war involving nuclear weapons;
- (4) to negate prospects of Soviet nuclear blackmail.¹⁸⁶

Missing from Weinberger's list is a role for the employment of nuclear weapons to assist in defeating the Soviets should any of (1) through (4) prove inadequate. Unfortunately, Secretary Weinberger has outlined an entirely passive nuclear strategy which can only serve to undermine the credibility of NATO's nuclear deterrent. Both Secretary Brown's and Weinberger's remarks may reflect an intentional omission of any discussion of nuclear employment strategies in order to avoid presenting what might

be perceived as an overly aggressive nuclear posture in Europe. However, it is equally likely that the omission is the result of NATO's inability to reconcile the requirement, implicit in flexible response, to conduct limited nuclear warfare with a Western defense philosophy solidly grounded in deterrence.

In a section entitled "The Role of Nuclear Weapons in Strategy," the latest DOD Annual Report specifies that one of the goals of the strategy of flexible response is

to provide the President with the option of using nuclear forces selectively (rather than massively), thereby restoring credibility and stability to our nuclear deterrent.

...we must plan for flexibility in our forces and in our response options so that there will be the possibility of terminating the conflict and reestablishing deterrence at the lowest possible ¹⁸⁷level of violence, thus avoiding further destruction.

Conceivably, the lowest level of violence may be at the theatre or tactical nuclear level, hence the requirement for nuclear forces other than those of a purely strategic nature. A war might escalate to include the use of tactical nuclear weapons and then deescalate as deterrence was re-established and war termination negotiations began. Under such circumstances a limited nuclear war would have been conducted. The point is that inherent in flexible response is the concept of controlled escalation along a continuum of conventional and nuclear response.

Yet, Administration officials, for reasons of uncertainty or to alleviate fears of a limited nuclear war or

both, have persistently denied the feasibility of actual combat being confined to theatre or tactical exchanges. The Reagan Administration's brief flirtation with notions of a controllable nuclear war drew heavy criticism from at home and abroad. In mid-1981 Secretary of Defense Weinberger presented the President with a plan to revitalize U.S. nuclear forces, with emphasis on correcting survivability deficiencies in command-control-communications (C3) and improving warhead accuracies. Portions of the plan were naturally leaked to the press which attacked the Administration as being hawkish and unnecessarily aggressive in its attempts to build a capacity to fight and win a nuclear war.

In October, asked if he thought there could be a limited nuclear exchange in Europe, President Reagan responded

I don't honestly know...I could see where you could have the exchange of tactical weapons against troops in the field without it bringing either one of the major powers to pushing the button.¹⁸⁸

Although there was more than a grain of truth in Reagan's comment, it prompted a massive public outcry, especially in Europe. Anti-nuclear activists had a field day attacking the Administration that "was planning a nuclear war." Los Angeles Times correspondent Robert Scheer, albeit in a somewhat exaggerated account, described the public reaction in his book "With Enough Shovels: Reagan, Bush and Nuclear War."

When word of the Administration's stance toward nuclear war began to spread, the result was a powerful sense of

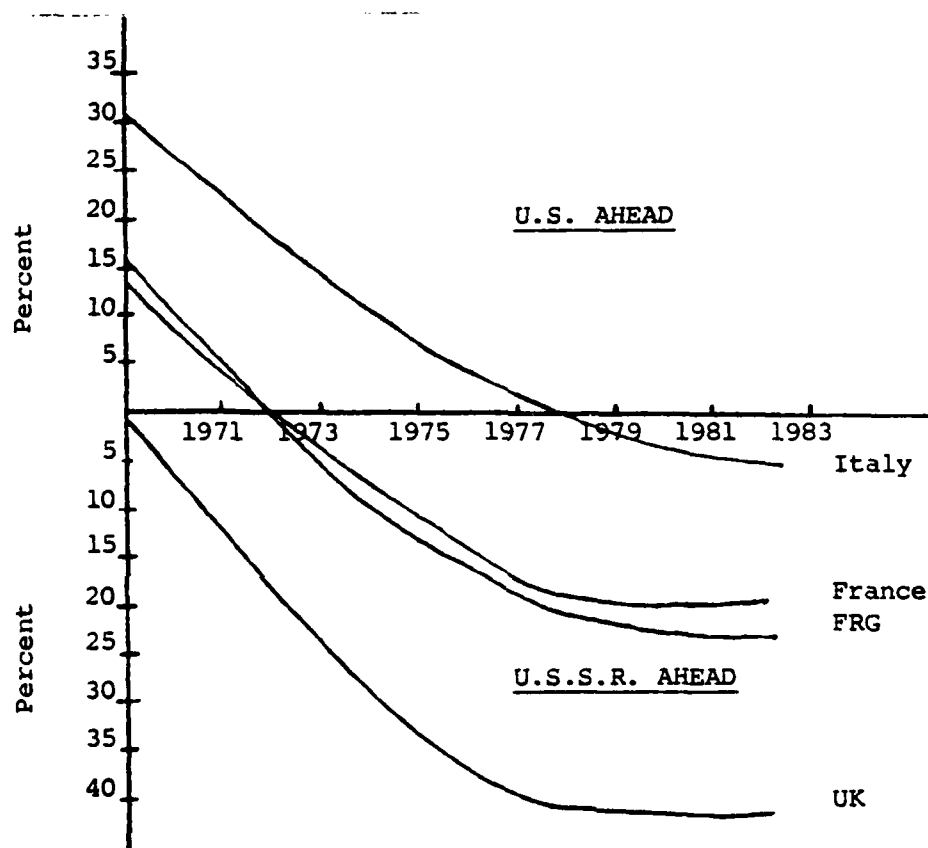
alarm among the general public, both in this country and abroad...Whatever else Reagan and his aides may have accomplished, they greatly stimulated the dormant peace movement in the free world and gave the Russians a fine opportunity to trumpet far and wide that the United States was the more bellicose of the two superpowers, the greater threat to human survival.¹⁸⁹

A short six months later the Administration's "peaceful" rhetoric stood in stark contrast to its earlier "bellicose" plans for nuclear war. In the spring of 1982 the President announced his intent to pursue Strategic Arms Reduction Talks (START) with the Soviets. In a January 1983 address in West Berlin, Vice President Bush stated that nothing infuriated the President and him "more than the suggestions that we are preparing to fight a nuclear war, because we are not preparing to fight a nuclear war. We are preparing to deter war."¹⁹⁰

Where nuclear strategy is concerned, it appears NATO has succumbed to relying strictly on deterrence and invoking ad-hoc options for coping with failures. The myriad of contradictions in U.S. declaratory policy and strategy has fostered confusion throughout official and extra-official ranks in the Alliance as to NATO's nuclear intentions during a Soviet assault. The visible absence of American leadership and partial paralysis of NATO-Europe governments by strong domestic anti-nuclear sentiment has contributed in large measure to the present "crisis" of NATO military inferiority and accompanying feelings of insecurity.

Figure 3 illustrates the dramatic decline, beginning in 1969,

FIGURE 3: PERCENT RESPONDING U.S. AHEAD MINUS PERCENT RESPONDING U.S.S.R. AHEAD IN MILITARY STRENGTH



*"Neither Ahead" response omitted. Average "Neither Ahead" response for all countries, all years was 27.5%.

Adapted from Kenneth Adler and Douglas Wertman, "West European Security Concerns for the Eighties: Is NATO in Trouble," paper delivered at the annual meeting of the American Association of Public Opinion Research, May 1981; Leo Crespi, "Trends in U.S. Standing in West European Public Opinion," U.S. International Communication Agency Report R-4-82; Bruce Russett and Donald DeLuca, "Theatre Nuclear Forces: Public Opinion in Western Europe," Political Science Quarterly 98, No. 2 (Summer 1983), pp. 179-196.

of perceived U.S. military strength vis-a-vis the Soviet Union by the four leading NATO-Europe powers.

Today, NATO faces an adversary which fields a qualitatively superior warfighting doctrine which integrates conventional and nuclear weapons on the battlefield. NATO's response, as ineffective today as twenty years ago, is to continue its attempts to persuade the Soviets of the futility of fighting a nuclear war.

We, for our part, are under no illusions about the dangers of a nuclear war between the major powers; we believe that neither side could win such a war....it is essential that the Soviet leadership understand this as well.¹⁹¹

However, the Soviets have thought about and planned for the "unthinkable," while NATO continues to blind itself to the very real possibility of its occurrence. Officially, NATO has concluded that nuclear war in any form is simply unwageable.¹⁹² Such a philosophy fails to admit that a Soviet incursion into Western Europe will undoubtedly be prefaced by a conscious awareness among Soviet leaders that nuclear exchanges are possible, victory will not be easy, but that the war is winnable. The Soviet's capability for initiating or shifting into a tactical nuclear campaign is as imposing as its capability for a large-scale conventional assault, and, inter alia, more likely to succeed against NATO defenses ill-prepared to defend against a limited nuclear attack. Under certain circumstances--fear of a NATO pre-emptive nuclear strike, serious territorial losses--the

Soviets may be willing to take the "nuclear chance." Without coupling a strategy of weapons employment to deter the Soviet Union, the Soviet Union faces no more of a credible deterrent than the addition of 572 long-range missiles to NATO's arsenal than presently exists in Europe without them.

B. DEEP STRIKE OR DEEP TROUBLE: THE "HI-TECH" CONVENTION OPTION

NATO's skepticism about its ability to defend against a Warsaw Pact attack without resorting to U.S. conventional strategic systems coincides with the recent growth in Soviet military power supported by what is widely known to be a very credible warfighting doctrine. This skepticism has encouraged the resurgence of demands for a NATO use policy governing nuclear weapons, more in the line of forestalling a tactically successful Soviet first strike against Europe than out of any clear moral aversion to limited nuclear war. Advocates of no-first use claim that NATO's highly visible reliance on the early first-use of nuclear weapons may force the Soviets to preempt with their own nuclear strike. This, in turn, will force a premature escalation to general nuclear war as NATO responds with its only surviving weapons system, U.S. and possibly European strategic nuclear weapons.

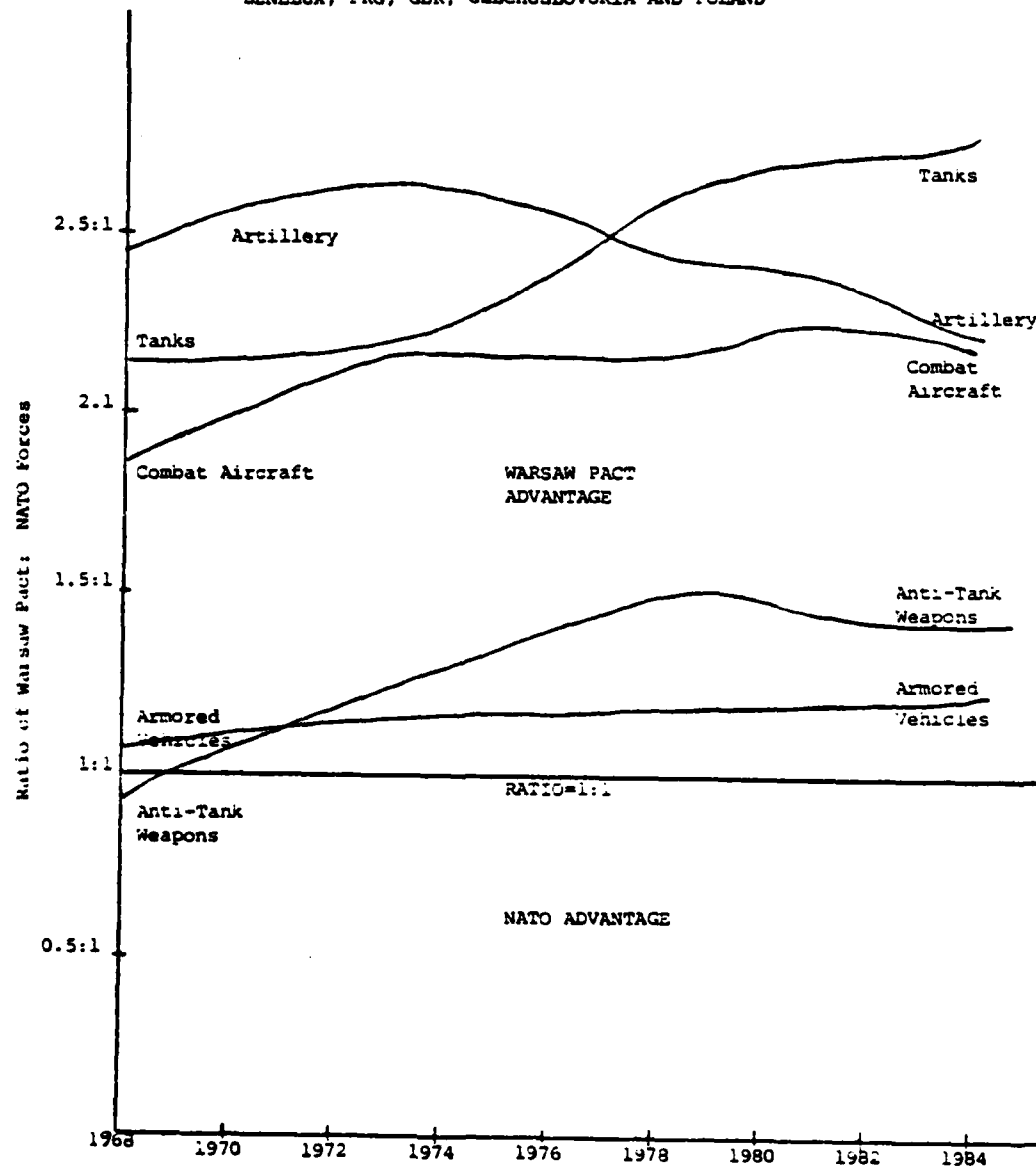
The idea that NATO adopt a no-first use policy is new. In 1962 Englishman John Strachey wrote that the United States would have much to gain and little to lose by making a declaration that we would never use nuclear weapons.

first."¹⁹³ There was, however, a caveat which rings as true today as in 1962. Strachey felt, as George Kennan and his coauthors recently echoed in Foreign Affairs, that the principal advantage of such a policy was not necessarily in its believability. It was in the resultant adoption of military doctrines and postures based on conventional ground and air forces "genuinely adequate in both quantity and quality to put up the most determined resistance to a Russian conventional attack."¹⁹⁴

The need for wholesale conventional force improvements, "in both quantity and quality," has long been recognized by NATO members and has permeated Alliance rhetoric since 1961. While few have argued the point, little action has been taken to go beyond the minimum conventional requirements believed necessary to force a nuclear escalation decision upon the Soviets. In the era of U.S. nuclear superiority (1945-1972) there was a measure of credibility to such a strategy.

However, U.S. nuclear superiority became a thing of the past following SALT I; whether in actuality or in the minds of men is unimportant. Since then, conventional force trends in the West have conspicuously failed to adapt to the strategic environment of nuclear parity. Figure 4 illustrates this by depicting the evolving Warsaw Pact: NATO ratio in five conventional force categories. Since the 1972 SALT I treaty the "bean-count" in the conventional

FIGURE 4: NATO CENTRAL REGION CONVENTIONAL FORCE TRENDS 1968-1983--
BENELUX, FRG, GDR, CZECHOSLOVAKIA AND POLAND



Adapted from John Collins and Anthony Cordesman, *Imbalance of Power: Shifting U.S.-Soviet Military Strengths* (London: Macdonald and Jane's, 1978), pp. 271-280; Anthony Cordesman, "The NATO Central Region and the Balance of Uncertainty," *Armed Forces Journal International* (July 1983), pp. 18-58.

balance has steadily moved in favor of the Warsaw Pact. In no case does NATO field superior numbers and in tanks, combat aircraft and artillery, Soviet forces outnumber NATO by greater than 2:1. This is not to imply that bean-counts and numbers alone are decisive. NATO's flexible response strategy explicitly avoids the need to match the Warsaw Pact on a one-to-one basis. NATO has concentrated its conventional defense efforts on improving its reserve and reinforcement capabilities, relying on a mobilization period of seven to thirty days to augment forward deployed forces. However, a recent study by Phillip Karber, director of the Strategic Concepts Development Center at the National Defense University in Washington, D.C., concludes that after 17 years of effort by NATO, guided by the precepts of flexible response,

...the ratio in conventional weaponry upon mobilization is still 2:1 in favor of the Warsaw Pact, and even more significantly, the ratio in conventional weaponry prior to mobilization--armament in forward deployed active units--¹⁹⁵ has increased to NATO's disfavor from 1.5 to 2 to 1.

Moreover, NATO's technological edge, a critical force multiplier for the West in the past, is also losing ground to Soviet technological advances in many key areas of warfare. Present imbalances throughout the East-West force postures have grown so serious that it is no longer possible to satisfactorily "rationalize" an ever-widening gap. Attempts to attribute the growth in Soviet military power

to defensive intentions and traditional Soviet insecurities blatantly overlooks an aggressive Soviet military doctrine and recent demonstrations of its implementation.

NATO's response to these Soviet advances has been an intensive conventional weapons program applying the latest in high technology weapons and sensors in a strategy designed to defeat a massive Soviet assault quickly and on East European territory. The program is a combination of advances in computer and circuitry miniaturization, a perceived need by NATO to reassert technological superiority, and, most importantly, an attempt to raise the nuclear threshold. It relies almost entirely on recent developments in so-called smart and precision guided munitions (SPGMs).

The concept of application, dubbed "Deep Strike" or "Assault Breaker," is aimed at denying Warsaw Pact forces follow-up reinforcements from rear echelons required by their strategy to maintain the momentum of a rapid breakthrough of NATO defenses. It is accomplished through the carefully planned application of SPGMs against time-critical targets formerly designated as nuclear targets. These include:

- (1) Counter-air (main and secondary aircraft operating bases)
- (2) Interdiction targets (bridges, road junctions, rail-heads)
- (3) Echeloned and mobile follow-on ground forces.
- (4) Massive armor attacks in the zone of contact¹⁹⁶

The idea is sound and technology well tested. Three obstacles, however, preclude any measurable implementation of a SPGM-based strategy for NATO at least into the early 1990's. First, the "hi-tech" option does not adequately compensate for growing numerical imbalances between NATO and Warsaw Pact forces which will soon outstrip any contribution of hi-tech weaponry. If NATO does not field large numbers of these weapon systems--as it appears it will not--the force multiplier effect of the SPGMs will be insufficient for NATO to credibly claim a conventional defense capability.

The second problem, directly related to the first, is the cost of developing and producing an adequate SPGM arsenal to cover all vital mission areas. In order to be effective and not merely self-defeating, the "Deep Strike" strategy must raise the nuclear threshold through the entire European theatre of operations, not just in selected mission areas.

Cost estimates range from a minimum of \$10.0 billion to \$320.0 billion to support the program into the early 1990's. This will require an additional 1-2 percent real increase in defense spending by the NATO countries, over and above the planned 3 percent goal of the 1977 LTDP. Meanwhile, most of NATO-Europe has fallen short of that 3 percent goal, struggling with high inflation and overriding domestic priorities. Although claims abound that an adequate

conventional defense can be purchased with a 3 percent real annual increase in defense spending, General Bernard Rogers (SACEUR) has stated that "the current force goals (1983-88) which NATO nations have accepted can be achieved with a 4 percent real increase in defense spending for each of those six years."¹⁹⁷ That 4 percent does not include the requisite SPGMs specified by advocates of the "Deep Strike" strategy.

The final problem is one of initiative. European defense ministers are clearly opposed to making the necessary investment to truly raise the nuclear threshold through a conventional build-up. The minister's lack of enthusiasm for the hi-tech option is based on what they believe to be a matter of "dollars and sense." Economically, the 3 percent LTDP has already pressed most European governments to the limit of domestically acceptable defense spending. When the "Deep Strike" technology and strategy were first officially introduced at the semiannual meeting of NATO defense ministers in Brussels in December 1982, the European ministers were in general agreement "that any additional defense spending for such advanced systems under present economic conditions was 'unrealistic'."¹⁹⁸

The French trimmed nearly \$2.0 billion off 1982 military expenditures as part of President Mitterand's budget cutting program. Orders for at least 15 Mirage 2000 fighter/bombers, 47 AMX-10 tanks and 26 155mm artillery batteries were

cancelled while the 24.6 percent of the defense budget allocated to nuclear forces went untouched. On 20 April 1983 the French government approved a five-year defense spending program which will reduce conventional land forces by 7-10 percent (about 30,000 men), including the dissolution of an army corps, an armored division and an infantry division. Two of the principal beneficiaries of the increase in nuclear expenditures are the M-4 nuclear submarine missile and Hades tactical nuclear missile. The British will soon have to confront the need to make similar cuts in order to support their Trident missile program.¹⁹⁹ British armed force strength has already declined by more than 7,000 over the past year (1982-1983). Finally, Italy's Socialist-led government recently approved tough austerity measures for 1984, combining higher taxes and \$21.0 billion in spending cuts to keep the budget deficit at \$63.0 billion dollars. It is most unlikely the Italians will encourage even greater defense spending in order to rehabilitate conventional forces in the next 3-5 years.

Incentive from the United States has also been lacking. In spite of strong support by the Secretary of Defense for the hi-tech strategy, big ticket nuclear items such as MX, the B-1B bomber and two nuclear-powered aircraft carriers continue to receive highest budget priority. In the past six years Congress has disproportionately cut Army procurement requests compared to action taken on Air Force and

Navy requests. In the combined fiscal years 1979 through 1984 defense procurement requests, the Army suffered a 4 percent cut in a total request of \$58.3 billion. The Air Force, however, lost only 1 percent of a \$119.2 billion request, while the Navy enjoyed a 1 percent increase over original requests totaling more than \$135.0 billion.²⁰⁰

As a result, the Army's budget cannot withstand the large hi-tech munitions orders required to make an exclusively conventional option viable. Furthermore, as late as the end of 1982, the Air Force--with more than twice the Army's budget authority--had yet to program the procurement of one submunition dispenser for its tactical aircraft. Taken as a whole, these events do not display a trend toward developing a serious conventional NATO defense and do not provide the encouragement to European leaders to renew the conventional emphasis.

Strategically, the SPGM option offers a trade-off which the Europeans are apparently unwilling to make, exchanging a nuclear war for a potentially equally destructive conventional one. The existing nuclear deterrent has worked well for over 30 years. The concern is that a bold move toward a credible conventional defense option based on SPGMs might pave the way for a dismantling or, at best, a deemphasis of the U.S. nuclear umbrella over Europe. Although the end product might be a more credible conventional defense capability, the prospect of a Soviet conventional attack would also be proportionately raised.

C. MOBILITY, VELOCITY AND INDIRECT APPROACH: LIDDELL HART AND THE NEW U.S. ARMY STRATEGY

In spite of European reluctance to move toward the conventional option described above and the Department of Defense's inability to purchase sufficient SPGMs, the U.S. Army has wholeheartedly adopted the concept and incorporated the "Deep Strike" strategy into its latest revision of the "Operations" field manual, FM 100-5 (1982).²⁰¹ Based on an exhaustive study of the defense of Europe titled "AirLand Battle," the Army has restructured its strategy to combine Assault Breaker technology with highly mobile counter-offensive operations against a Soviet attack.

FM 100-5 (1976) based defense of the European central front on tactics of attrition. Following an initial Soviet assault, the manual recommended sending a brigade-size covering force to identify the main axis of Soviet advance. Remaining brigades would then mass across the path of Soviet advance and attempt to envelop the attacking formations in heavy fields of artillery and air-to-ground fire. If a Soviet breakthrough appeared imminent, tactical nuclear weapons could be employed to slow the advance and signal to the Soviets a dramatic escalation of the conflict.

Critics of the doctrine were convinced it was too defensive. Moreover, it was dangerous to confront the Soviets head-on with a strategy of attrition considering the numerical superiority of the forces they could field on short notice. Within the Army, dissatisfaction mounted as

"commanders became convinced as a result of field training and war games that they would be unable to defeat the Soviets using the doctrine of 1976."²⁰² Attrition studies tended to support these conclusions.

Attacking Pact forces would probably try to--and would with present forces--establish a local battlefield superiority of about 5 to 1 at those points where they plan to force a breakthrough. Even if a well-prepared, deliberate forward defense could inflict 40% losses on those forces during the first 36 hours of the war, and could hold NATO's own losses to only 25%, the ratio of NATO to Pact strength would change to about 6½ to 1 as Russia's second echelon formations reached the front. Even if NATO could continue for another 36 hours to inflict 40% losses on the attacker and hold its own losses to 25%, Warsaw Pact units would have a ¹⁰ to 1 advantage three days after the outbreak of war.²⁰³

FM 100-5 (1982) outlines a dramatic redirection of the ground force effort in Europe when compared to FM 100-5 (1976). To cope with Soviet forces close to the forward edge of the battle area (FEBA), the new revision prescribes an indirect approach, the framework for which was described by Liddell Hart in the 1950's. The "Deep Strike" concept of operations provides the means to attrite Soviet second and rear echelon forces before they join the battle at the FEBA. The object is to isolate and destroy the forward forces and prevent reinforcement by striking at rear echelon targets.

The 1982 manual implicitly acknowledges Soviet superiority in the field and assumes a guerilla warfare-like tone of "hit and run" operations characteristic of a numerically inferior belligerent.

[Army units] will maintain the agility necessary to shift forces and fires to the points of enemy weakness. Our operations must be rapid, unpredictable, violent, and disorienting to the enemy.

The best results are obtained when the initial blows are struck against critical units and areas whose loss will degrade the coherence of enemy operations, rather than merely against the enemy's leading formations.²⁰⁴

Ironically, even though the Army has incorporated the AirLand Battle concept and associated "Deep Strike" strategy into its doctrinal bible, FM 100-5 (1983), NATO Commander General Bernard Rogers has adamantly declared that it is not NATO strategy. In a spring 1983 article in Strategic Review General Rogers wrote that NATO's strategy "should not be confused with the U.S. Army's concepts of 'AirLand Battle' and 'AirLand Battle 2000'." Rogers explained that the Army concepts were "developed independently of ACE's (Allied Command Europe) initiatives or its concept of operations."²⁰⁵ According to Rogers, associating ACE doctrine and defense plans with purely national concepts like AirLand "is not a desirable NATO process."

General Roger's dissociation of U.S. Army and NATO strategies is probably the least salient of the problems generated by the Army's new strategy outlined in FM 100-5 (1982). Most obvious is the lack of munitions to accomplish the deep strike mission. Second echelon high technology munitions such as the Multiple Launch Rocket System (MLRS), the Joint Tactical Missile System (JTACMS), and the Conventional Attack Missile (CAM) are several years away from

operational deployment. In the absence of the SPGMs and delivery vehicles specified in the hi-tech option, the manual identifies artillery as one of two primary strike assets for deep attacks, the other being air interdiction.²⁰⁶ Present artillery units, however, cannot hope to accomplish the deep strike mission without extensive and large-scale penetration of enemy territory, an unlikely possibility for U.S. or NATO forces early in battle. Table 4 illustrates these characteristics for modern U.S. artillery units.

TABLE 4: CHARACTERISTICS OF U.S. FIELD ARTILLERY¹

	105mm M102 (T)	155mm M109A1 (SP)	155mm M198	8-inch M110 (SP)	8-inch M110A1 (SP)
Maximum range (km)	11.5	18.1	24/30 ²	16.8	20.6
Sustained rate of fire (rds/minute)	3	1	1	0.5	0.5
Maximum rate of fire (first 3 min)	30	12	12	4.5	4.5

¹T=towed, SP=self-propelled

²With rocket-assisted projectile

Adapted from FM 6-20, "Fire Support in Combined Arms Operations," pp. B-A-1 to B-A-3.

The most significant failing of FM 100-5 (1982) is in its exclusive focus on conventional operations against non-nuclear aspects of a Soviet threat which is patently nuclear in orientation. The "myth" of NATO first-choice of nuclear weapons is perpetuated. The opening chapter mentions the importance of "integrating conventional, nuclear, chemical, and electronic" means of defense but no further discussion of integration is contained in the manual.

In contrast to the 1976 edition, the 1982 revision of FM 100-5 contains no separate chapter on tactical nuclear operations, does not discuss the nuclear weapon package, employment, or chain of command, and avoids reference to nuclear weapons altogether other than noting they are "particularly effective in engaging follow-on formations or forces in depth." There is, in fact, more detailed discussion about the battlefield use of smoke than of tactical nuclear weapons.

Finally, the Army's new "AirLand-Deep Strike" strategy, as outlined in FM 100-5 (1982), is incompatible with the use of the long-range theatre nuclear forces deployed beginning December 1983. To be effective the strategy requires large numbers of conventional SPGMs and submunitions to cover a significant proportion of over 2500 time-urgent Warsaw Pact targets (Table 5). Such arsenals, however, do not exist and will not until the mid-1990's. In the interim, the Department of Defense claims the Pershing II and GLCM can be assigned those tactical deep strike missions.

By virtue of their high accuracy, both Pershing II and GLCM will provide an effective capability to attack hard targets while limiting collateral damage...Pershing II offers a high assurance of penetrating future Soviet defenses, has the capability to strike time-urgent targets, and takes advantage of the existing Pershing 1A infrastructure. GLCM's longer range will allow it to attack deeper targets and to be based further rearward...²⁰⁷

While claims can easily be made in Annual Reports and public statements, actual employment of the weapons in a

TABLE 5: HIGH VALUE, TIME-SENSITIVE TARGETS IN WARSAW PACT 2ND
3RD ECHELONS. (NATO's CENTRAL REGION)

<u>Type of Targets</u>	<u>Range Beyond Border--Kilomet</u>			
	<u>0-30</u>	<u>30-100</u>	<u>100-300</u>	<u>300-800</u>
<u>Fixed:</u>				
Airfields (Main Operating Bases	-	13	31	28
Choke Points (Bridges, Railyards, Highway Obstructions)	12	10	91	78
Underground (Nuclear Storage, C, Fuel Sites)	5	27	87	43
Total Fixed Targets	17	50	209	149
<u>Mobile:</u>				
Maneuver and Artillery Battalions in 76 Division Force	832	132	426	294
Nuclear Missile and Support Units	256	129	104	87
<u>Total Mobile Targets</u>	<u>1,088</u>	<u>261</u>	<u>530</u>	<u>381</u>
Total Targets	1,105	320	739	530

SOURCE: Schemmer, "Nato's New Strategy," p. 55

limited, tactical deep strike role is dubious. Under the existing deployment scheme the 572 LRTNF missiles provide coverage for less than 50 percent of the time-sensitive targets between 100 and 800 kilometers from the expected FEBA, assuming 100 percent missile reliability.²⁰⁸ Only a very small portion, roughly 10 percent, are fixed and hardened targets requiring the high yield of the Pershing II (250kt) and GLCM(200kt). Consequently, use of these missiles against "softer" targets would squander an important and limited intra-war deterrent, exceed any rational conception of proportionality of force, and offer a poor incentive for controlling subsequent counter-escalation.

Complicating matters even further will be the difficulty of dispersing the Pershing II and GLCM. As Richard Betts correctly points out, "the political and psychological constraints against dispersal, however, will be even stronger than against authorizing full alert, mobilization, and reinforcement of conventional ground forces."²⁰⁹ Since dispersal of the weapons might be interpreted as a first-strike intention, NATO leaders will invariably wait until the last minute to disperse and thereby risk losing the weapons by a similar Soviet first-strike, conventional and/or nuclear.

In brief, while the Army's "Deep Strike" strategy is a viable concept, it is at least a decade away from reality. In addition to the problems of procurement already mentioned, European governments will remain reluctant to

endorse the strategy until a comprehensive arms limitation agreement is negotiated which codifies a theatre nuclear balance in short and long range systems. Until then, the imbalances in theatre nuclear capabilities favoring the Warsaw Pact will continue to make serious attempts at conventional defense appear futile. Because NATO has forsaken the pursuit of nuclear superiority, an adequate conventional defense capability can be developed only after a mutually deterring theatre nuclear balance is believed to exist. Once this is accomplished and European leaders believe the prospects for nuclear war, limited or otherwise, are appreciably lower than they are today, the requisite attention and resources can legitimately be diverted toward conventional rearmament.

For the time being, FM 100-5 (1982) prescribes a strategy which the Army ground forces in Europe cannot apply. The weapons for the vital deep strike missions are not in NATO arsenals. The more traditional objective of halting Soviet attacks at the West German border remains the most salient measure of NATO's success. Since NATO's conventional forces are most unlikely to accomplish this in any but the most ideal circumstances, NATO must continue to rely on nuclear systems as the inevitable backstop for a faltering conventional defense.

The absence of a doctrine and employment guidance for theatre nuclear systems may eliminate the possibility that

a NATO-Warsaw Pact confrontation will be limited to the lowest level of violence. Short range battlefield nuclear weapons have been given only ancillary attention since the LRTNF assumed the limelight. Early employment of Pershing II and GLCM, however, erases a conspicuous termination point for a low-level nuclear escalation-deescalation process. It is deceptively easy to expect these weapons, along with so-called limited nuclear options (LNOs), to offer similar prospects for controlling escalation as the shorter range systems such as nuclear artillery, Lance or Honest John. Comparison of employment options, yields, launch points, targets, collateral damage and the like indicate they do not.

Outlining a theatre/tactical nuclear doctrine and strategy does not imply a reflexive nuclear warfighting strategy. On the contrary, it provides the defender with additional options in the event he has to fight such a war other than resort to strategic systems. NATO's existing nuclear policies invite an inordinately high level of escalation too early. Even though NATO-Europe may prefer the inherent uncertainties in this strategy, one need only consider the consequences of its failure to realize the need for a lower level nuclear employment strategy.

VII. FLEXIBLE RESPONSE AND TACTICAL NUCLEAR ALTERNATIVES

Nuclear strategy is the art of the impossible because in the final analysis nuclear weapons are too horrific for their use to be contemplated in a rational calculation of possibilities. Now that we are perched on this moral high ground, some might say that the discussion must end...Alas, the world of moral and intellectual purity is rarely the world of politics. Because nuclear weapons exist, and because there is an enemy against whom defense is perceived to be necessary,²¹⁰ the art of nuclear strategy needs to be explored further.

Virtually all political leaders and military strategists in the West are in agreement that the fundamental tenets of the flexible response strategy--direct forward defense, deliberate and controlled escalation, and general nuclear response--provide a sound strategic base from which NATO can deter or defend against a Soviet attack. However, accompanying the latest developments in advanced conventional munition technologies and the LRTNF modernization and deployment program has been a flurry of criticism directed at NATO's flexible response forces. While self-criticism of its force structure is not a new phenomenon, NATO's failure to respond to the rapid growth of Soviet military power through the 1970's has generated harsh and abundant commentary from its own leaders, including many intimately associated with the NATO military organization.

Belgian General Robert Close, formerly Commander of the 16th Armored Division of NATO Forces in Germany, claims the

Soviets now have the capability to occupy West Germany "from the iron curtain to the Rhine" within 48 hours."²¹¹

In a summer 1982 article in Foreign Affairs, General Bernard Rogers reported that NATO forces could sustain conventional combat in Europe for only a matter of days. As a result, NATO "must now depend upon the use of theatre nuclear weapons to accomplish our missions of deterrence and defense."²¹² One year later the situation, according to General Rogers, had gotten no better. During a July 1983 interview with Armed Forces Journal International he stated:

We're fairly close to massive retaliation today. We can only fight conventionally for a relatively short period of time...Our publics need to know we have only a delayed tripwire instead of massive retaliation.²¹³

General Rogers' ominous claim is no mere "scare tactic" to generate additional defense funds from NATO governments. It is substantiated by facts. Figures 5 and 6 depict the primary avenues of approach of a Warsaw Pact assault and the corps sectors of military responsibility in NATO's Central Region. The North German plain is considered the most likely main attack axis with terrain that is highly conducive to large-scale tank operations. Its defense will be difficult in any scenario which includes powerful Soviet armored operations. In 1981-1982, the 1st British Army Corps in West Germany revamped its ground strategy for the forward defense of the British sector. Corps Commander Lieutenant General Nigel Bagnall found that a stalwart defense at the

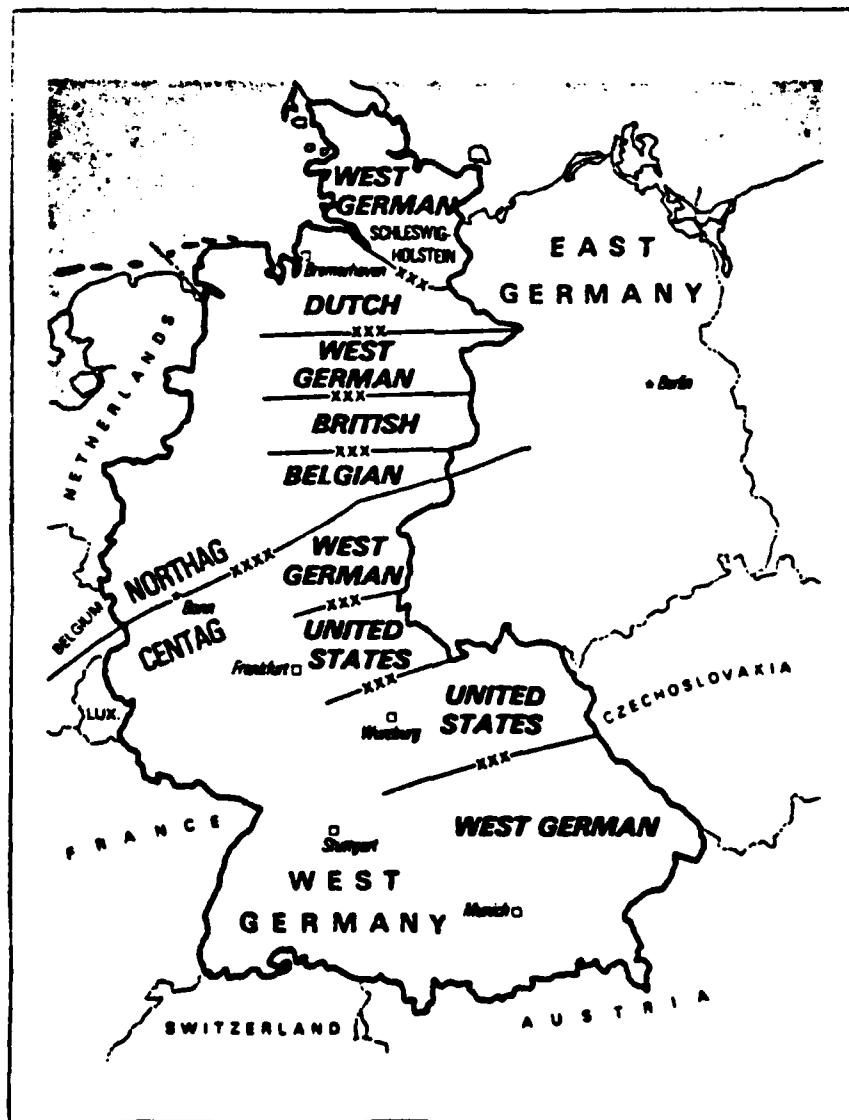
FIGURE 5: WARSAW PACT AVENUES OF APPROACH
TO WESTERN EUROPE



Source: Adapted from Richard Lawrence and Jeffrey Record, U.S. Force Structure in NATO (Washington, D.C.: Brookings Institution, 1974), p. 31.

FIGURE 6: CORPS SECTIONS OF MILITARY RESPONSIBILITY
IN NATO'S CENTRAL REGION*

*NORTHAG (Northern Army Group) and CENTAG (Central Army Group) are the two subdivisions of NATO forces in West Germany. The line dividing the two runs from Belgium through West Germany, just south of Bonn and into East Germany.



Source: Adapted from Richard and Jeffrey Record, U.S. Force Structure in NATO (Washington, D.C.: Brookings Institution, 1974), p. 31 and also from U.S. Army materials.

border would cause tremendous losses in manpower and equipment. Instead of a true forward defense, he has opted "to select the best defensive ground from which he could counterattack and gain time."²¹⁴ The trade-off is that a sizable portion of West Germany may be sacrificed, at least initially, to a Soviet assault. Further complicating an effective forward defense is the fact that only a few battalions of Dutch and Belgian troops are actually stationed in their sectors in West Germany. The majority of those forces must be deployed from inside their respective countries.²¹⁵

Weapons and ammunition shortfalls continue to plague all of NATO's forward deployed forces. Moreover, the ammunition on-hand, both conventional and nuclear, may be ineffective against key Soviet targets. The U.S. Army has advised Congress that the 105mm high velocity gun and ammunition used on the M-60 and M-1 Abrams tanks cannot defeat the frontal armor of the two latest Soviet tanks, the T-80 and improved T-72, in a frontal engagement.²¹⁶ A suitable 120mm gun for the M-1 capable of penetrating the Soviet armor will not enter the field until 1986 or 1987. With respect to non-strategic nuclear weapons, the bulk of the nuclear artillery shells in the NATO arsenal today are not ballistically matched to conventional shells used for spotting and correcting artillery shell trajectories. Delivery accuracy is therefore highly susceptible to changes in wind speed and

direction and differences in the ballistic characteristics of nuclear and conventional shells. New enhanced radiation shells being produced are ballistically matched to their conventional counterparts but are stockpiled solely in the United States.

Contrary to the high expectations surrounding NATO's 1967 adoption of the strategy, flexible response has only marginally reduced the automaticity and escalatory level of NATO's nuclear response options to Soviet aggression. As conventional force imbalances became increasingly apparent during the early and mid-1970's, NATO Nuclear Planning Group studies indicated that the deterrent value of the threat of nuclear escalation was becoming dependent upon linking first (NATO) nuclear use to the course of a land war in Europe.²¹⁷ At this critical juncture in the 1970's, where the military balance was conspicuously shifting in favor of the Soviet Union, NATO failed to move decisively toward either a credible conventional or nuclear defense strategy. Coupling such an action to NATO negotiating positions in the Mutual and Balanced Force Reduction (MBFR) talks and SALT quite possibly would have enabled NATO to reverse, or at least slow, the destabilizing trend of the Soviet military build-up. Instead, NATO conventional force posture went essentially unchanged and serious discussion of nuclear employment strategy remained taboo.

The net result, which NATO has carried into the 1980's, is a self-imposed reliance on nuclear weapons for the defense of Europe grounded in a strategy which the NATO Commander has appropriately dubbed a "delayed tripwire." Ironically, the situation today poses many of the same problems for NATO which prompted the shift to flexible response in the first place. While remaining heavily reliant on nuclear weapons, the lack of consensus on theatre and tactical nuclear employment strategies continues to raise serious doubts as to NATO's ability to effectively prosecute a European-theatre war and impose some sort of qualitative limitation or restraint should nuclear weapons be introduced into the conflict. NATO faces unavoidable and potentially costly delays during an East-West crisis as Western governments agonize over nuclear employment decisions. According to a former High Level Group member, "NATO has not yet managed to agree on guidelines for the follow-on use of nuclear weapons if a first attempt to communicate NATO's intentions through a controlled demonstrative use did not succeed in persuading the adversary to halt hostilities."²¹⁸

Official U.S. efforts to resolve issues of NATO nuclear strategy have been infrequent and lackluster and act to perpetuate the confusion. Since the mid-1960's successive Administrations have been obsessed with establishing unambiguous linkages among and between the different levels of nuclear response--battlefield, theatre and strategic.

Unfortunately, this has been more of a reaction to NATO-European concerns over U.S. "coupling" than to the needs of deterrence and defense vis-a-vis the Warsaw Pact. As a result, all U.S. nuclear forces "are governed by a single coherent policy...There is no separate U.S. policy for non-strategic nuclear forces."²¹⁹

Under a "single coherent policy," a nuclear weapon is a nuclear weapon, regardless of size, shape, yield or target. Accordingly, adherents to a single coherent policy claim that there is no reason to devise distinct employment guidelines for various classes of nuclear weapons, particularly at the theatre and strategic nuclear levels. However, the output of the various arms control forums, the myriad of NATO nuclear study groups, and volumes of Congressional testimony reveal that, at a minimum, theatre and strategic nuclear weapons are conceptualized differently. Dissimilar targeting options, yields, accuracies, and cost reveal important practical differences exist as well. It is unlikely that a government, NATO or Warsaw Pact, would employ or respond to a limited nuclear attack originating with a land-based ICBM reentry vehicle the same as an attack which was restricted to theatre-based nuclear weapons such as Lance or Pershing.

Coincident guidelines cannot simultaneously govern the employment of both strategic and theatre nuclear weapons. NATO's failure to distinguish between their warfighting

capabilities and elaborate separate employment guidelines forecloses nuclear response options which would employ only one class of nuclear weapon or deliberately adhere to a controlled escalation sequence. Contrary to one of the fundamental tenets of the flexible response strategy, present NATO nuclear doctrine makes no provision for an obvious intra-war stopping point and is not conducive to interruption or termination before large-scale nuclear exchanges. Instead, it invites a rapid escalation process that may be extremely difficult to reverse.

Furthermore, the United States is attempting to capitalize on the uncertainty facing the Soviet leadership of a NATO nuclear response as the keystone of NATO deterrent strategy at a time when its ability to do so is dwindling. General Alexander Haig summarized the importance of this uncertainty, a point made by nearly every defense official in the past 15 years.

...it is essential to recognize that the deterrent value of those [strategic nuclear, theatre nuclear, and conventional] forces lies not in their independent warfighting capabilities, but in their independent contribution to the uncertainty of our potential response.²²⁰

According to Thomas Schelling, it is this uncertainty which permits NATO (and the Soviet Union) to manipulate the risk of general war before and during hostilities and makes a nuclear deterrent strategy credible. The whole purpose of introducing theatre and tactical nuclear weapons is to "create and signal a heightened risk of general war" for all

participants.²²¹ Schelling's theory of risk manipulation accurately describes the psychological aspects of NATO's flexible response strategy. NATO relies on the everpresent threat of escalation, heightening the risk of general war, to deter and, if necessary, limit conflict in Europe and force early termination of hostilities. That is the essence and value of the controlled escalation aspect of flexible response.

In the mid-1960's and early 1970's, NATO politicians and military planners believed their pre-war bargaining position, their ability to manipulate the risk of general war, to be equal or superior to that of the Warsaw Pact. They also believed, probably correctly, that NATO's "Second-Strike" position would remain virtually unchanged after the onset of hostilities. Throughout this period NATO could credibly respond to or threaten violence at varied and increasingly advantageous levels of escalation, lending strong support to its pre- and intra-war bargaining positions. In defense jargon, NATO possessed undisputed escalation dominance.

The situation which exists in the 1980's is radically different. NATO is no longer able to "risk manipulate" with the same confidence of a decade ago. Soviet achievement of superiority in most, if not all, measures of military power has severely eroded NATO's perceived intra-war bargaining position. Reluctance to agree upon a nuclear employment

doctrine and strategy has undermined NATO's pre-war bargaining position and its ability to exploit the risks inherent to nuclear threats and a nuclear strategy. Soviet "uncertainty," crucial to NATO's deterrent, is substantially reduced as NATO decisionmakers debate if any nuclear option can be implemented in response to Soviet aggression, and which option will be most effective. Schelling is quoted to point out that critical issues between major adversaries

...are decided not by who can bring the most force in a locality, or on a particular issue, but by who eventually willing to bring more force to bear or at least make it appear that more is forthcoming.²²²

A. ESCALATION MYTHS, ESCALATION FEARS

The indiscriminate nature of a single policy governing strategic and non-strategic nuclear weapons and the uncertainty that permeates NATO's own perception of its response to Soviet aggression nurture Western fears of a runaway escalation process once nuclear weapons are introduced into a NATO-Warsaw Pact conflict. Defense analyst Barry Schneider has summarized the most relevant criticism of a theatre/tactical nuclear employment strategy. On the idea itself, Schneider claims that the argument advocates of a limited nuclear warfighting strategy are "contradicted by a more powerful set of arguments that explain why the idea of being able to fight a limited nuclear war against the Soviet Union or Warsaw Pact is an illusion."²²³

He identifies five supposedly insuperable problems of a nuclear warfighting strategy:

- (1) Once the nuclear threshold has been broken, there is no easy stopping point on the way to the top of the escalation ladder. Pressures to launch more escalatory and preemptive attacks would be enormous.
- (2) A nuclear war is likely to grow simply because command and control procedures will break down in battle. Political leaders are likely to lose control of their nuclear forces in the field.
- (3) Once nuclear weapons are detonated over the battle area, radars and electronics equipment may become useless because of the electromagnetic pulse (EMP) caused by such explosions. The logical next step would be the launching of "blind" volleys of longer-range, higher-yield tactical nuclear weapons.
- (4) The introduction of nuclear weapons into the battle would create enormous confusion and stress at all decision-making levels. The stress upon U.S. and Soviet decision-makers could easily trigger irrational and emotional responses.
- (5) Escalation of a limited nuclear exchange would seem inevitable because Soviet military forces apparently emphasize high-yield theatre nuclear weapons that would spread lethal radioactive fallout to cover large areas.

Schneider, along with most opponents of limited nuclear strategies, argues that escalation is far more likely to occur than limitation. The first-use of nuclear weapons by NATO would invariably trigger "massive Soviet and Warsaw Pact nuclear responses leading to further escalation." These conclusions, as any concerning tactical nuclear warfighting, are not based on empirical facts or experience but a particular perception of and emotional reaction to nuclear weapons.

Nevertheless, the inherent uncertainties of a nuclear war, limited or otherwise, should not act to perpetuate the emotionalism which has long dominated nuclear strategic planning. Adherents of the "Schneider Philosophy" automatically exclude middle level nuclear warfighting options which may prove to be stabilizing during a superpower conflict. Contrary to a popular but unfounded belief, the planning and availability of nuclear options does not increase the likelihood of nuclear war. A planning process which comes to grips with nuclear employment problems and constraints in advance may, in fact, reduce the chances of a nuclear war or at least minimize the possibility of extraneous casualties. Aware that various options and responses are available, government leaders will be less apt in a crisis to quickly resort to rash nuclear employment strategies laden with emotion. Rather, the probability that "cooler heads will prevail" is enhanced.

With the exception of the EMP problem, none of Schneider's criticisms are intrinsic to nuclear weapons themselves but are largely a function of the failure of NATO tactical nuclear doctrine to deal with the problems. In the first place, while the line between conventional and nuclear warfare is undoubtedly clear and unequivocal, the distinction between strategic and battlefield nuclear weapons is not altogether ambiguous. This is particularly evident in the recent trend toward low-yield nuclear weapons providing

very tailored effects, such as the enhanced radiation weapon. Development of flexible employment guidelines and a wholesale revision of the single nuclear weapons policy would make feasible a controlled escalation sequence which recognized and made recognizable the distinctions between classes of nuclear weapons.

Second, a complete breakdown of battlefield command and control will not necessarily lead to a widespread, unauthorized use of nuclear weapons. Considering the existing Permissive Action Link (PAL) security systems and rigid nuclear release authentication procedures, it is just as likely that such a breakdown will result in the paralysis of nuclear employment options since battlefield commanders will be unable to launch weapons. Moreover, nuclear command and control is presently receiving the Defense Department's highest priority for modernization and survivability improvements.

Third, although the EMP problem is a serious one, it is not as insurmountable as Schneider and others claim and is subject to effective countermeasures. According to Samuel Glasstone, "for locations that are not within or close to the deposition region for a surface or air burst, both the amount and rate of EMP energy received per unit area on or near the ground will be small, regardless of the type of nuclear explosion."²²⁵ Highly maneuverable formations and unit dispersion on the battlefield, can therefore

dramatically reduce the impact of EMP. In addition, much OF NATO's military hardware is hardened against EMP threat by shielding, special circuit design, grounding and various other protective devices.

Fourth, Schneider is correct in assuming that the introduction of nuclear weapons would generate enormous stress upon decisionmakers. The propensity of NATO decisionmakers toward "irrational and emotional responses," however, is largely due to the absence of nuclear options and alternatives. The availability of several discrete nuclear options would help decisionmakers avoid a rapid and potentially uncontrollable escalation process by providing levels of response at which both sides can reestablish an intra-war deterrent. Furthermore, the presumption that any nuclear weapon detonation will trigger an all-out exchange is purely speculative. Former Secretary of Defense James Schlesinger has argued that

...should there be a breakdown of deterrence, there will be very powerful incentives on both sides to restrain the destructiveness of the use of nuclear weapons, and to come as rapidly as possible to the termination of not only the war but also the causes of war that led to that hopefully small-scale use of nuclear weapons. ²²⁶

Finally, the inevitability of escalation because of a Soviet theatre nuclear arsenal which is characterized by high-yield and low accuracy weapons can no longer be considered a valid conclusion. Likewise, claims that Soviet military doctrine makes no provision for limited nuclear

wars is being challenged by analysts throughout Western defense establishments. Advanced warhead technologies have very likely been incorporated into the latest Soviet theatre nuclear weapons, SS-20/21/22, all of which are estimated to represent a significant reduction in yield over their predecessors.

After extensive study of the unclassified Soviet military literature, analyst Joseph Douglas has concluded that the Soviets are capable and prepared to fight a nuclear war confined to a specific theatre of operations.

The characteristics and objectives of theatre and inter-continental war are so clearly different--objectives, risks, forces, strategy and tactics--that the Soviets seem to have no difficulty in envisioning a nuclear war limited to the theatre--so long as the theatre does not expand to include strikes on the Soviet Union itself.²²⁷

...the Soviets also appear to have recognized explicitly the limited use of nuclear weapons and other weapons of mass destruction in local wars.²²⁸

James Schlesinger noted this trend several years earlier during his tenure as Secretary of Defense.

In their exercises the Soviets have indicated far greater interest in the notions of controlled nuclear war and non-nuclear war²²⁹ than has ever before been reflected in Soviet doctrine.

In short, while the control of nuclear escalation is in no way a foregone conclusion in a NATO-Warsaw Pact confrontation, neither is its automaticity. Although the initial escalatory framework will depend upon the dictates of circumstance, it appears that downward pressures to constrain escalation frequently will be as prevalent and as strong

as any incentives to the contrary. Without a viable theatre nuclear employment doctrine and associated strategies, however, NATO will be unable to take maximum advantage of those pressures to limit the extent of nuclear exchanges.

Present nuclear doctrine restricts NATO to a rigid employment sequence with a minimum of flexibility. A "nuclear demonstration" of NATO resolve in an area peripheral to the central theatre of operations is likely to prompt a rapid and militarily decisive nuclear response by the Soviets, not withdrawal. Such a demonstration by NATO would be a squandering of its first-use initiative. NATO's other nuclear alternative, resort to limited nuclear options with long-range theatre and strategic weapons, cannot respond to the exigencies of battlefield operations. Moreover, it would begin the escalation process at the upper end of the escalation spectrum, eliminating any possibility of confining nuclear warfighting to a small-scale employment of low-yield, strictly battlefield weapons.

Fighting in Europe is most likely to be kept under control if NATO, by altering the theatre balance after the onset of hostilities, can persuade the Soviet Union not only that the costs of its aggression will be prohibitively high, but that its ability to conduct that aggression will be severely degraded.²³⁰ NATO simply cannot accomplish this mission with its present force structure and strategy.

Conventional forces are inadequate and theatre/tactical nuclear forces lack sufficient guidelines to govern an effective employment strategy. A force which possesses nuclear weapons but is unprepared to operate with them on the battlefield against a similarly equipped, but well trained adversary, does not contribute to the credibility of the deterrent or defense aspects of the weapons. As long as theatre and tactical nuclear weapons remain in the NATO arsenal, the wrong signal is being sent to the Soviets if they can assign little credibility to NATO's threat to actually use the weapons.

Without a doubt, a thoroughly credible conventional force posture is the least threatening and most promising alternative to the fears of escalation generated by nuclear warfighting strategies. However, NATO's unwillingness to fund the necessary improvements in its conventional forces and the Soviet's formidable theatre nuclear arsenal makes a tactical nuclear option an essential addition to the menu of NATO's response alternatives. Lacking a tactical nuclear option, NATO may find itself in the midst of an East-West confrontation faced with the choice of "suicide or capitulation," a choice virtually guaranteed to accompany a predominant reliance on massive retaliation as a deterrent.

B. FOUR ALTERNATIVE TACTICAL NUCLEAR POSTURES

Proposals for alternative theatre and tactical nuclear postures abound in the unclassified strategic studies

literature. Academics, politicians, military men, think tanks and "armchair strategists" frequently make recommendations prescriptive in nature but lacking in sober assessment of the costs, force requirements and political viability. Most reflect an exaggerated concern with the deterrent qualities of theatre/tactical nuclear weapons and strive to posture those forces accordingly. Few attempt to construct a framework for battlefield employment of the weapons, placing their faith in a hopefully incontestable deterrent and fears of escalation.

However, it is unwise and dangerous for NATO to assume away potential failings of an exclusively deterrent posture. Structuring forces to maximize their deterrent value does not necessarily yield the most credible of defense forces. It was this realization in the late 1950's which led the move away from massive retaliation toward flexible response. Forces structured and oriented toward a credible defense (warfighting) posture, on the other hand, tend to present a well-rounded and effective deterrent. Not only are the socio-political costs of aggression made prohibitive at the upper end of the escalation ladder, where strategies of massive retaliation and assured destruction come into play, but also at the lower end by posing more than a mere spectre of defeat for the adversary's forces on the battlefield.

When deterrence fails, however, and the opponent has deliberately weighed the risks and still decided to attack, the dividends of a viable warfighting defense are

unquestionable. But unless such a defense is acquired,²³¹ it is too late to try to regain it after a war starts.

Applied to theatre and tactical nuclear doctrine, this means that a strategy for the battlefield employment of those weapons must (1) assist in the defense of Europe in a militarily significant and decisive manner against a range of serious Warsaw Pact threats and (2) provide a credible linkage to U.S. strategic forces. The necessity of a trans-Atlantic nuclear linkage precludes a "no-TNW" alternative from NATO's response options.

The range of choice available to NATO is outlined below in four theatre nuclear posture options. Although none of the variants are completely exclusive, each has qualities which sufficiently distinguishes it from the others to warrant separate treatment. Most posture recommendations will fall within the general structure of only one of the categories described with minimal overlap between options. In reviewing each option, particular attention is given to feasibility with present force levels, advocacy of enhanced radiation weapons, level of nuclear control, prospects for escalation control, and collateral damage potential from NATO's own weapons.

1. Updated Flexible Response

Updated flexible response is the option which describes the present status and direction of NATO's nuclear posture. Theatre nuclear force modernization is an integral component of the updated flexible response posture and part

of an overall effort aimed at rehabilitating NATO's aging military hardware, nuclear and conventional. Nuclear-related programs are limited primarily to modification and upgrade of existing weapons and associated support systems. Included are improvements in theatre command, control and communications (C3), deployment of long-range theatre nuclear missiles with advanced warhead guidance and acquisition technologies (Pershing II/GLCM), and the development and stockpiling of enhanced radiation warheads for the 8-inch and 155mm artillery-fired atomic projectiles (AFAPs) and Lance missile.

Programmed improvements are almost entirely hardware oriented. The absence of any parallel changes in theatre nuclear employment doctrine portends a continuation of the existing policies and strategies into the late 1980's and 1990's. Without concomitant changes in employment doctrine, the updated flexible response option suffers the same dangers and internal inconsistencies which plagued NATO's flexible response strategy in the 1970's and early 1980's.²³² Problems of escalation control remain and are somewhat heightened by the deployment of the long-range, high-yield Pershing II and Ground Launched Cruise missiles. The near obsession of the NATO governments with their deployment assures the Pershing II and GLCM central positions in NATO's nuclear defense posture under the updated flexible response option. However, NATO's deployment plans for the 572

launchers--108 Pershing II and 464 GLCM--reflect no clearly identifiable military rational or Alliance concept for employment.²³³ Early resort to these weapons precludes a timely and controlled execution of a low-level nuclear option and begs a Soviet response in kind. Even the battlefield option is of questionable utility (and credibility) as long as NATO maintains a short-range nuclear arsenal largely composed of medium (11-50kt) and high (51-500kt) yield weapons. Collateral damage considerations, "a la Carte Blanche," will channel the NATO nuclear decisionmaking process toward the irresistible conclusion that any employment option will prove self-destructive.

Updated flexible response merely preserves an obsolescent strategy with new technology. It adds little to NATO's security assets which can be construed as either credible deterrent or effective defense. In short, updated flexible response is the continuation of intra-Alliance compromise on nuclear-related issues in order to achieve a consensus at the lowest common "strategic" denominator.

2. Inflexible Response

The inflexible response option is primarily a European originated answer to the dangers of extensive collateral damage inherent in updated flexible response. As such, it could be called a collateral damage minimizing option. Although it is the most aggressive of the theatre nuclear options, inflexible response is perhaps the most palatable

option to NATO governments after updated flexible response. Advocates of this option argue that the nuclear aspects of the present (updated) flexible response strategy were devised when NATO possessed undisputed theatre nuclear superiority. Since that superiority has passed to the Soviets, such a strategy is no longer credible.

One variant of the inflexible response option, proposed by Alton Frye, rejects short-range battlefield nuclear employment altogether. According to Frye, the first-use of tactical nuclear weapons subjects Western Europe to intolerable direct and collateral damage. Furthermore, not only does the forward location of NATO nuclear stockpiles invite preemption, but any movement of stockpiled warheads to mate with missile or artillery batteries is bound to be detected and would signal imminent escalation to the Soviets.

Initial nuclear employment should therefore be targeted against Soviet military targets in Eastern Europe.

...initial use of nuclear weapons by NATO should be directed against Soviet military targets in Eastern Europe in order to minimize collateral damage to those already suffering from conventional attack and to signal that, if escalation is necessary, the enemy will pay the entry price on his own territory.²³⁴

Frye discourages the use of enhanced radiation weapons. He claims that Soviet armored and troop formations would be so dispersed as to require the employment of very large numbers of the low-yield enhanced radiation weapon. This would result in much the same extensive collateral

damage expected from significantly fewer "traditional" tactical nuclear weapons. Rather than avoiding collateral damage, the ERW may magnify it. Instead, Frye recommends a small, compact and invulnerable arsenal of highly accurate, long-range theatre nuclear weapons.

Several problems arise with Frye's particular version of inflexible response. First, NATO would have to develop and deploy a new theatre nuclear missile force to make the strategy viable. The Pershing II and GLCM forces are of too high a yield to be used against strictly military targets. Both lack the requisite invulnerability, being "movable" not "mobile," to credibly threaten a first-use against Eastern European targets. In addition, the GLCM has a long flight time which is unable to respond to mobile, time-urgent Warsaw Pact targets, the type expected to be moving through Eastern Europe toward the front. Such military considerations say nothing of the tremendous political and economic costs a new nuclear missile development and deployment program would place upon NATO.

The second, and most conspicuous, weakness of Frye's inflexible response is that it fails to deal with the Warsaw Pact forces coming across the West German border and penetrating deep into NATO territory. As a result, NATO governments may be faced with a Soviet fait accompli as Warsaw Pact forces occupy a critical portion of West Germany and then cease hostilities short of drawing a heavy NATO nuclear response.

A second inflexible response variant seeks to remedy these problems, but at the cost of greater risk of escalation. François de Rose, former French ambassador to NATO (1970-75), recommends a strategy which entails the employment of enhanced radiation weapons against a Soviet armored assault coupled with nuclear strikes against military targets in the Soviet Union if Warsaw Pact forces have made strikes of this type against Western Europe. Any nuclear reply by the Warsaw Pact to short-range ERW employment by NATO would trigger an immediate nuclear response against military targets inside Soviet territory.

De Rose's inflexible response option, so titled by de Rose himself, has the advantage of addressing both short-range and long-range nuclear forces in the NATO inventory and blending them into a coherent strategy. Unlike Frye, de Rose develops a credible defense against the Warsaw Pact armies on the march inside NATO territory. Just as important is the fact that de Rose's option is feasible with existing forces-in-being and explicitly assigns a militarily rational role for the Pershing II and GLCM.

This whole question has to be seen in the perspective of Moscow's aims, as revealed by its attitude over the present Euromissiles program--the Pershing IIs and cruise missiles now scheduled for deployment in 1983. If no Soviet nuclear weapons could be used against Western territory without immediately provoking American nuclear attacks on targets within the Russian boundaries, the coupling between European defense and American strategic forces would be more solidly established than ever. 239

It is, however, de Rose's instantaneous "strategic" retaliation to any Warsaw Pact nuclear employment on NATO soil which partially undermines his otherwise sound recommendation by unnecessarily raising the risk of escalation. Recalling Joseph Douglass' conclusion that the Soviet Union is prepared to wage a limited nuclear war, "so long as the theatre does not expand to include strikes on the Soviet Union itself," it is apparent that Alton Frye's alternative of an East European targeting scheme is an essential precursor to nuclear employment on Soviet territory. It can be both militarily significant and an effective signal of NATO resolve without presenting the Soviets with a threat which might initiate large-scale nuclear exchange. At the very least, it creates a nuclear plateau at which escalation can cease that does not exist in de Rose's formula.

Two of the cardinal tenets of crisis management and crisis bargaining state that decisionmakers should (1) avoid taking steps which seal off an opponent's "escape routes" and reduce his alternatives to zero, and (2) make every effort to slow the pace of crisis events.²³⁶ A fusion of the de Rose-Frye inflexible response concepts offers the means to achieve these goals while simultaneously presenting an effective defense on the battlefield. The inflexible response option appears to be a significantly more credible pre-war deterrent than (updated) flexible response and a viable warfighting strategy as well. In spite of the title

inflexible response, the de Rose-Frye option contains the seeds for a NATO defense strategy which integrates nuclear and conventional weaponry.

3. Unrestricted Tactical Nuclear Operations

The unrestricted tactical nuclear operations option is predominantly the product of French strategists Pierre Gallois and Marc Geneste, although a small contingent from Los Alamos laboratories in New Mexico has proposed a similar nuclear-based European defense strategy. Gallois and Geneste argue that NATO defense doctrine and strategy are the products of American "ethnostrategic" thinking. Problems automatically arise since European and American perceptions of the Soviet threat are not identical and, in fact, are increasingly divergent. Consequently, detente, East-West trade, even the NATO-Warsaw Pact military balance are viewed through a different prism on each side of the Atlantic.

The American-devised flexible response strategy depends ultimately on a credible assured destruction posture which Gallois and Geneste claim is satisfactory for the United States but incredible for Europe. Assured destruction merely prevents escalation from involving the superpower's homelands, making sanctuaries of Soviet and American territory and discrediting U.S. promises to "trade New York for Paris." In order to support these conclusions, Geneste demanded that Europeans ask themselves

...why U.S. strategic weaponry has advanced to include MIRVs and ABMs during the past decade, while the nuclear arsenal specifically designed for European defense still consists of the blind "blunderbusses" of the 1950's likely to devastate friend and foe alike if used.²³⁷

The only realistic means of accomplishing European defense against a numerically superior Warsaw Pact is believed to be a defense solidly grounded in nuclear weapons. Requirements include a highly mobile tactical nuclear force backed by a small but credible Euro-strategic retaliatory capability akin to the French "force de dissuasion." The risk of Soviet escalation to include U.S. territory arising from a strictly European nuclear employment outside U.S. control can be considered remote, "provided America carries out her part of the mission by maintaining strategic parity or (preferably) superiority vis-à-vis the U.S.S.R."²³⁸ The proposed posture must include a (European) nuclear second-strike capability in order to block Soviet recourse to escalation confined to the European theatre.

On the battlefield, a moderate conventional force is retained to induce the massing of Warsaw Pact forces along primary corridors of attack and increase their vulnerability to tactical nuclear strikes. Use of the enhanced radiation weapon is recommended to reduce collateral damage and, more importantly, to optimize the primary killing mechanism of radiation against armored and infantry formations. In the Geneste scheme, nuclear-equipped armored corps are kept behind the "atomic killing zone" to fulfill missions of

counterattack and territorial occupation after the initial nuclear deluge. Territorial defense forces assure security behind the front lines.²³⁹

The Los Alamos group, led by R. Sandoval and David Buden, have proposed a detailed nuclear defense organization, substituting nuclear firepower for conventional manpower coupled to an air-defense system to deny Warsaw Pact air forces an effective role over NATO territory.²⁴⁰ Four integral components comprise the nuclear defense system:

(1) approximately 22,500 combat units of some 30 men to provide target acquisition and terminal guidance for low-yield ERW missiles, (2) 600-900 mobile nuclear missile units with Lance-type missiles capable of extremely quick delivery (five minutes), (3) mobile heavy reconnaissance units of 4200 men each, covering roughly 500 square kilometers, (4) heavy area air-defense using Roland and Hawk missile batteries. This array of forces would be deployed across a 100-kilometer deep by 900-kilometer long defense zone. Like Geneste's proposal, Buden and Sandoval recommend a militia about 500,000 strong to provide local defense in areas behind the front. In both schemes, nuclear release authority is extended to a considerably lower level than the present control by National Command Authority (NCA), perhaps as low as battalion or platoon commander.

The most notable obstacle to implementation of the unrestricted tactical nuclear option is the inevitable domestic

opposition to an all-nuclear defense strategy. The troublesome and highly vocal resistance to the Pershing II and GLCM deployment reflects a Europe which, at best, barely accepts the present requirements of a moderate size nuclear deterrent force. Moreover, the development and construction costs of a relatively invulnerable second-strike force poses unacceptable budget increases for nearly all the NATO governments.

Second, although an unrestricted tactical nuclear option appears to compensate for any U.S. decoupling actions, European fears of a U.S. withdrawal from Europe are probably greater than any confidence instilled by a European nuclear defense plan. The European propensity to "go it alone" has not been an evident characteristic of North Atlantic Alliance politics since 1949. In the same vein, no U.S. Administration will easily relinquish its traditional control over a potentially nuclear European battlefield.

Finally, the problems created by European nuclear proliferation for both superpowers would be most unsettling. This is especially true for the Soviets in the case of a "nuclearized" West Germany. Geneste, Gallois and Sandoval all avoid the political implications of the problem. According to Geneste,

Because only national sanctuaries are considered to have credible protection, all European nations should be "sanctuarized"--that is, each nation, if it so desires, should possess the "key" to nuclear strategic retaliation. This would not be difficult to arrange, since

the hostaging system of strategic defense is based on retaliation, not on first-strike capabilities.²⁴¹

Nonetheless, a strong Soviet response would be expected, not only diplomatically, but in changes to its military doctrine, arms control position and East-West relationships to account for the new "strategic" threat. Such changes may prove dangerously destabilizing and threatening to European security, negating any possible positive contribution of the unrestricted tactical nuclear option. Since NATO is presently unable to adequately accommodate nuclear weapons in a flexible response strategy, it is unlikely that the Alliance will be able to adjust to a strategy which completely omits a conventional response. The unrestricted tactical nuclear operations option will remain only the subject of papers and lectures by messieurs Gallois and Geneste.

4. Integrated Battlefield Operations

The integrated battlefield operations posture is an attempt by strategists, almost exclusively American and British, to reach a happy medium which alleviates some of the perceived problems of the previous two options, inflexible response and unrestricted tactical nuclear operations. Whereas Frye neglects the battlefield problem completely and de Rose targets the Soviet Union proper uncomfortably early, the integrated battlefield option responds to the exigencies of the battlefield and Warsaw Pact reinforcements echeloned in Eastern Europe without posing

unacceptable risks for further nuclear escalation. Unlike the unrestricted tactical nuclear option, on the integrated battlefield tactical nuclear weapons are part of a composite conventional and nuclear strategy. Importantly, there is no attempt to treat nuclear weapons as the "employable equal" of conventional weapons. Rather, nuclear weapons are used in a militarily significant manner against targets when conventional weaponry is considered insufficient.

The purpose of the integrated battlefield option is to stop an attack at or very near the border by striking the leading elements and immediate reserves of the advancing Warsaw Pact armies. While conventional operations are essentially unrestricted within the European theatre, nuclear weapons employment is confined to an area close to the FEBA. Laurence Martin advocates the use of a tactical nuclear "covering force" in support of battlefield operations.²⁴² The covering force would conduct a very shallow nuclear interdiction campaign against logistics and reinforcement centers such as major road junctions, railheads and airfields. The interdiction campaign would be directed against critical but stationary targets thereby eliminating problems of target acquisition evident on the battlefield with highly mobile, armored formations. In all cases, Warsaw Pact command and control elements and deep reserves are avoided in order to minimize the escalatory threat.

The most important feature distinguishing the integrated battlefield option from the others is the call for a credible conventional defense effort and nuclear employment only after the conventional defense is in danger of failing. A Warsaw Pact assault does not trigger an automatic nuclear response but places nuclear forces on alert for rapid and possibly early action. Since tactical nuclear doctrine is revised accordingly and incorporated into NATO battle plans, the decision to employ nuclear weapons is not hampered or delayed by a prolonged NATO decisionmaking process. Instead, it awaits the outcome of the initial Warsaw Pact assault against NATO's conventional forward-deployed defenses before applying an essentially pre-planned nuclear response.

Civilian strategist Colin Gray and Army Major Ronan Ellis recommend a Presidential pre-release plan for low-yield tactical nuclear weapons, particularly ERW, with strategic and long-range theatre weapons remaining under the close control of the NCA.²⁴³ Major Ellis specifically proposes a command by negation control scheme, the opposite of the present fail-safe procedures used by the strategic bomber force requiring positive NCA confirmation before weapon launch. With command by negation, the theatre commander sends the NCA a message outlining nuclear employment plans. If no reply is received within a predetermined time frame, the plans are assumed approved. Only short-range, low-yield

weapons are covered by the command by negation control scheme.

The underlying assumption of the integrated battlefield option is that, once faced with a limited but militarily decisive employment of tactical nuclear weapons by NATO, the Soviets will not opt for further escalation to achieve their aims fearing an uncontrollable escalatory spiral. The key, of course, is for Soviet leaders to realize that the battlefield nuclear strikes are consciously limited in nature. The force structure and targeting plans of the integrated battlefield option are designed to reinforce these Soviet perceptions. This not only shifts the burden of escalation to the Soviets, but also dramatically reduces the chances for a successful Warsaw Pact blitzkrieg into Western Europe. For a successful "bolt from the blue" or limited warning scenario to be advantageous to the Soviets, a large-scale preemptive nuclear strike would appear to be a prerequisite. This, however, is an unlikely alternative considering the potential for U.S. strategic, or long-range NATO theatre, nuclear involvement against targets within the Soviet Union.

In the integrated operations option, tactical nuclear weapons are no longer a symbolic deterrent, but a viable and controlled warfighting instrument. Battlefield and near-battlefield targeting of Warsaw Pact assets can effect a favorable shift in the theatre balance for NATO

and thwart Soviet attempts at quick victory or a fait accompli. It is low-level nuclear initiative which "provides for minimum escalation, deters conventional attacks and can be implemented immediately at minimum cost."²⁴⁴ The option forsakes notions of nuclear punishment as a deterrent in favor of local defense by denial. Moreover, an effective coupling apparatus between NATO theatre and U.S. strategic forces is tightly knit into the strategy by placing a heavy escalatory burden on the Soviets for any measure of success to appear likely.

The option is not without problems. Questions will inevitably arise as to what determines the breakpoint of a failing conventional defense and battlefield nuclear employment. For planning purposes the option requires fairly rigid criteria be applied so that an employment decision can be made early and without prolonged debate. Paper scenarios and war plans, however, frequently bear only slight resemblance to the unexpected events of a real crisis. In addition, the brief period of conventional forward defense allows at least some penetration of Warsaw Pact forces into NATO territory and introduces problems of collateral damage subsequent to any nuclear employment. The use of enhanced radiation weapons would reduce but not eliminate the problem which worsens with increased depth of penetration by the Warsaw Pact.

Finally, the nuclear orientation of the integrated battlefield option could create one of the same problems which continues to plague flexible response, that of maintaining adequate conventional forces and equipment procurement. The decade and a half under flexible response provides more than enough evidence of NATO's incessant habit of underfunding conventional force goals, choosing instead to rely on a formidable nuclear arsenal and the uncertainty of nuclear response. Constant attention must be devoted to maintaining a balance between conventional and nuclear forces if integrated battlefield operations are to be conducted effectively.

No one individual option can solve NATO's "nuclear dilemma" or capture all the desirable attributes of the optimal nuclear employment strategy. Drawing from the options outlined above, particularly inflexible response and integrated battlefield operations, it is possible to devise a nuclear employment strategy which combines military effectiveness on the battlefield with an escalatory resistance not present in NATO's existing flexible response strategy. The precise and discriminate employment of nuclear weapons has been made possible by a revolution in warhead and guidance technology.

As long as NATO continues to incorporate some sort of nuclear option into its defense plans, it must take advantage of the technological advances of the enhanced

radiation weapon. The weapon is no less nuclear than its fission counterpart, only more effective. It can be seen from Table 6 that, for all burst heights, an ER warhead produces the same radii of military effectiveness as a fission warhead of ten times greater yield with considerably less collateral damage potential and less residual radioactivity.²⁴⁵ Significant reductions in warhead yield are therefore possible. The new Lance ER warhead (W70-3) is reported to have options in the range of 1-5 kiloton, a tenfold reduction over the presently deployed Lance fission warhead.²⁴⁶

When tied to accuracy improvements in modern delivery systems, short-range nuclear missiles can be employed against time-urgent battlefield targets where mobility and dispersal would make conventional munitions ineffective except by an extremely heavy and costly concentration of fire. Terrain contour matching, infrared signature recognition, microwave discrimination and distance measuring equipment are presently available missile guidance technologies with a circular error probable (CEP) of less than 50 meters.²⁴⁷ Accuracy is no longer a function of range; precision weapons delivery is a reality. As a result, fewer weapons of lower yield are required to complete a designated theatre mission, accomplished with possibly less collateral damage than would accompany a concentrated application of conventional high-explosive weapons.

TABLE 6: RADII OF NUCLEAR EFFECTS*
(feet)

		PERSONNEL EFFECTS ¹			URBAN DAMAGE	
		8000 rads	3000 rads	650 rads	severe	light
1. BURST HEIGHT = 500 FEET	Weapon					
	1-KT ER	2500	3000	4000	1400	1800
	10-KT Fission	2500	3000	4000	3000	4000
2. BURST HEIGHT = 1500 FEET	Weapon					
	1-KT ER	2500	3000	4000	0	800
	10-KT Fission	2500	3000	4000	4000	5000
3. BURST HEIGHT = 3000 FEET	Weapon					
	1-KT ER	1000	2000	3500	0	0
	10-KT Fission	1000	2000	3500	1700	3500
						5000

¹The three dosage levels shown in Table 6 are used by the U.S. Military to represent the following responses for personnel exposed to these levels:

8000 rads: personnel will become incapacitated within five minutes after exposure and for physically demanding tasks will remain incapacitated until death. Death will occur in 1-2 days.

3000 rads: personnel will become incapacitated within five minutes of exposure and will remain so for 30-45 minutes. Personnel will then recover but will be functionally impaired until death. Death will occur in 4-6 days.

650 rads: personnel will become functionally impaired within two hours of exposure. Personnel may respond to medical treatment and survive this dose; however, the majority of exposed personnel will remain functionally impaired until death in several weeks.

*The radiation dosage radii are for personnel in the open, at the surface in urban areas, or in unarmored or lightly armored vehicles. For personnel in heavily armored vehicles, there will be about a 10 percent reduction in radius for the two lower bursts; for the higher burst, the largest dosage (8000 rads) cannot be delivered at the surface; there will be about a 30 percent reduction of the 3000 rads radius and a 20 percent reduction at 650 rads.

SOURCE: Cohen, The Neutron Bomb, pp. 67-69

While developments in nuclear weapons technology have overcome many of the preconceived employment problems--collateral damage and residual radiation among the most important--advances in theatre and battlefield communication systems make nuclear command, control and communication (C3) more reliable, secure and survivable. The Department of Defense is continuing to upgrade satellite communication links between the NCA and theatre commanders. The Ground Mobile Forces Satellite Communication (GMFSATCOM) program and MILSTAR, a new satellite communications system with extremely high frequency (EHF) communications channels, incorporate a number of survivability features and provide the deployed commander with real-time, jam-resistant tactical communications throughout the theatre of operations. New theatre nuclear C3 equipment is highly mobile and hardened against EMP effects.

Improvements have not been limited to technological advances. Several theatre C3 systems are the products of multiservice efforts to correct deficiencies in coordinated battle management capabilities and enhance interoperability among U.S., as well as NATO, tactical forces. The Joint Surveillance and Target Attack Radar System (JSTARS) is a merger of the Army's Battlefield Data System (BDS) and the Air Force's Pave Mover program intended to provide wide-area, moving target surveillance and targeting capability. The Joint Tactical Information Distribution System (JTIDS) is

a joint service program for distributing high-capacity, secure and jam-resistant digital information to tactical air, land and naval forces. Used in conjunction with the Army/Marine Corps Position Location Reporting System (PLRS-JTIDS Hybrid), it provides combat commanders with precise, near-real-time identification and locating data of own forces. Similar programs to those outlined above are in progress to assure adequate interoperability among U.S. and NATO tactical forces.²⁴⁸

The combination of these battle management systems and discriminate nuclear warfighting capabilities gives NATO, for the first time, the ability for a truly flexible, responsive strategy against the Warsaw Pact at several levels of escalation. At all but the lowest levels of nuclear employment, the burden of escalation rests with the Soviets. It would be a Soviet decision to initiate a major nuclear aggression to which NATO could credibly respond and stalemate at any level. No strategy, conventional or nuclear, flexible or inflexible, is immune from the dangers of escalation. However, in an environment where mutual assured destruction (MAD) is the capstone of superpower deterrence, defense strategy must internalize a large measure of escalation resistance. Measured responses, restricted targeting, and qualitatively limited weapons employment are actions which can create multiple plateaus at which an escalation process can be stopped or possibly reversed. A strategy

devised from a synthesis of the frameworks outlined by Frye, de Rose, Ellis and Gray can produce such controlled actions.

"Deterrence is not, and cannot be, bluff." Possession of an acceptable deterrent force does not obviate the need for a parallel defense capability. Doctrine, force structure and strategy must embody a credible employment scheme for a variety of crisis conditions. In spite of the understandable political difficulties, and as long as NATO foregoes an adequate conventional defense force, a plausible nuclear warfighting doctrine must be the skeleton which supports the body of deterrence.

With respect to the nuclear components [of a deterrent], the unquestioned ability to implement an all-out response must be maintained. Yet, for certain aspects of deterrence, the number of weapons is less critical than the existence of a doctrine, the will to abide by that doctrine, and weapons systems consistent with that doctrine which permit the deliberate use of weapons in those circumstances that may require a nuclear response.²⁴⁹

In the brief paragraph above, former Secretary of Defense James Schlesinger has cogently summarized the importance to deterrence of combining a viable nuclear employment doctrine and strategy with deployed nuclear systems. NATO's failure to do so has made a scarecrow of its theatre nuclear deterrent. After years of peering "over the fence," the Soviets will eventually realize that the scarecrow exists for appearances only.

VIII. CONCLUSION

Perhaps more valid Armes,
Weapons more violent, when we next meet,
May serve to better us, and worse our foes,
Or equal what between us made the odds,
In Nature none:...

He who therefore can invent
With what more forcible we may offend
Our yet unwounded Enemies, or arme
Our selves with like defence, to mee deserves²⁵⁰
No less than for deliverance what we owe.

No aspect of NATO military doctrine is shrouded by greater uncertainty, speculation, and moral sophistry than nuclear war-planning. Debate on the subject is characterized by the complete absence of field data from which to judge the efficacy of limited nuclear weapons employment. No tactical or theatre nuclear weapon has been "tried and tested" in an operational environment to prove its battle-worthiness, nor will one be in peacetime. Lacking the plentiful facts and figures available for conventional weapon systems, defense planners and strategists find developing nuclear warfighting options discouraging.

The personal and professional costs of advocating such nuclear options are reflected in the almost exclusively adverse media coverage critical of public statements made by prominent government officials and private analysts concerning NATO's ability to wage and win a limited nuclear engagement with the Warsaw Pact. As a consequence, what

limited nuclear war-planning is accomplished is confined to the secretive halls of the Pentagon and defense-oriented "think tanks." In all cases it is out of the public eye and, more importantly, out of the public mind. Yet, the attempts to quietly reconcile nuclear dilemmas generally focus on maximizing the deterrent value of the weapons, not on their warfighting utility.

The fact that the existing NATO force structure presents a formidable deterrent to Soviet aggression is not in dispute. More than 500,000 troops, thousands of tanks and aircraft, and a sizable tactical nuclear arsenal unquestionably pose serious problems for any Soviet offensive. But what if the pre-war deterrent fails?

Most NATO officials, including SACEUR, concede that in order for Western conventional defenses to repel or stalemate a Soviet offensive near the inter-German border, NATO must mobilize before the attack to reinforce front line and reserve units. A recent study of twentieth century conventional deterrence by John Mearsheimer concludes that NATO conventional forces are adequate to hold the line long enough to press the Soviets into an unattractive war of attrition. Mearsheimer's conclusion, however, is based upon the assumption that NATO mobilizes in tandem with any Soviet mobilization effort. He admits that "once the gap in mobilization starting time reaches seven days (in the Pact's favor), NATO begins to face serious problems that become

even more pronounced as the mobilization gap widens further."²⁵¹

Nevertheless, Western fears of a mobilization spiral similar to that which preceded World War I may very well "immobilize" NATO's reaction to otherwise ample warning of an impending Soviet invasion. The precedent already has been established in NATO's inaction immediately prior to the 1968 Soviet invasion of Czechoslovakia.²⁵² Moreover, in light of its inherent weaknesses, Soviet commanders may choose to boldly test NATO's present flexible response strategy relying on NATO's own uncertainty and confusion to bottleneck the nuclear decision and release process long enough to penetrate deep into West German territory. Once 70 to 100 kilometers inside the West German border, urban sprawl and increasing population density will most likely eliminate a NATO nuclear option, at least at the tactical level.

A previously established and credible threat of tactical nuclear employment increases the capability of those conventional forces already deployed. Soviet armor and troop formations are forced to increase dispersion and, because of limited space, echelon their attacking forces in nearby rear areas. Vulnerability to conventional NATO fire is heightened.

If NATO is unprepared or unable to respond with sufficient conventional force, it may be necessary to employ

tactical nuclear weapons in order to maintain a forward defense line. The need for a viable tactical nuclear strategy is not only obvious but imperative. The availability of useful tactical nuclear options renders the prospect of a successful Soviet surprise attack or armored blitzkrieg considerably more precarious and may entirely blunt such an attack in the event it does occur. Considering the risks, and assuming rational leaders in Washington and Moscow, both sides will find it difficult to justify escalating a nuclear conflict beyond the battlefield as long as reasonable chances for a settlement exist.

That is, as long as the NATO commitment and means to defend Western Europe are well-defined and NATO resolve is not questioned. As Thomas Schelling has pointed out, "if the commitment is ill-defined and ambiguous--if we leave ourselves loopholes through which to exit--our opponent will expect us to be under strong temptation to make a graceful exit (or even a somewhat graceless one) and he may be right."²⁵³ The importance of establishing and maintaining closely integrated declaratory and action defense policies cannot be overemphasized. A large disparity between the two, or a belief by the Soviets that such a disparity would be likely, can invite aggression rather than deter it. Serious problems for deterrence and crisis management arise should the Soviets expect NATO to succumb to the "temptation to make a graceful exit." Signals sent to the Soviets

should not be wholly ambiguous and open to interpretation. The development of credible tactical nuclear options fills an important gap in NATO's threatened escalatory sequence which extends beyond the mere symbolic to operational linkage of conventional and strategic nuclear responses.

Finally, the development and preparation of tactical nuclear warfighting plans could have a positive impact on the difficult theatre nuclear arms control process. Between 1979 and 1988 NATO will have unilaterally reduced its tactical nuclear arsenal by some 2400 weapons, more than one-third the pre-1979 total.²⁵⁴ In return, NATO will have received no compensatory reductions from the Warsaw Pact. NATO, for all of its good intentions, has no concrete idea of the type or size nuclear arsenal it needs. The difficulty of negotiating an acceptable arms control agreement from such a tenuous position is obvious. With an employment strategy and guidelines in place, the United States would negotiate with concise arms control goals in mind. The balance between NATO's arms control and nuclear force postures would be readily apparent. Flexibility in negotiations would be less susceptible to political pressures and more responsive to NATO security requirements.

NATO's refusal to undertake a large conventional force build-up has important implications in the event its defenses are tested by the Soviets. The Alliance may find it necessary to employ nuclear weapons at or near its borders.

For more than thirty years emotion, misconception, and bureaucratic inertia have thwarted serious attempts to formulate an effective limited nuclear war strategy. Moreover, it is the American "style of strategic planning" to spend considerably more time managing large defense programs than attending to operational issues. In the 1980's, the Warsaw Pact threat and advances in nuclear weapons technology have combined to make limited nuclear war an issue with which NATO must contend. Pragmatic nuclear employment plans cannot and will not be devised on a nuclear battlefield. A sensible tactical nuclear employment doctrine serves to expand the alternatives available to NATO, enhancing deterrence and defense.

The decision to deal with the problem must be made today. NATO's "nuclear scarecrow" is rapidly losing its imposing countenance.

NOTES

1. Colin Gray, Strategic Studies and Public Policy (Lexington: University of Kentucky, 1982), p. 25; Lothar Ruehl, "The Threat Perceived? Leverage of Soviet Military Power in Western Europe," in The Soviet Asset: Military Power in the Competition Over Europe, ed. Uwe Nerlich (Cambridge: Ballinger Publishing, 1983), p. 203.
2. Charles Murphy, "Defense and Strategy," Fortune, December 1953, p. 83.
3. Quoted in Robert Scheer, With Enough Shovels: Reagan, Bush and Nuclear War (New York: Random House, 1982), p. 216. The Scheer-McNamara interview also appears in the Los Angeles Times, 4 April 1982.
4. George F. Kennan et al., "Nuclear Weapons and the Atlantic Alliance," Foreign Affairs 60, No. 4 (Spring 1982), p. 762. The authors advocate a parallel conventional build-up in conjunction with the shift to no-first use. See also Robert McNamara, "The Military Role of Nuclear Weapons," Foreign Affairs 62, No. 1 (Fall 1983), pp. 59-80.
5. Letter from Representative Lodge and response from Secretary Acheson. U.S., Department of State Bulletin, 26 September 1949, pp. 476-477.
6. Helmut Schmidt, Defense or Retaliation: A German View, trans. Edward Thomas (New York: Praeger Publishers, 1962), p. 10.
7. Bernard Brodie, The Absolute Weapon (New York: Harcourt, Brace and Company, 1946).
8. U.S., Department of State Bulletin, 8 August 1949, p. 187.
9. Charles Donnelly, U.S. Defense Policies in 1965 (Washington, D.C.: Government Printing Office, 1966), p. 192.
10. Ibid.
11. Robert Osgood, NATO: The Entangling Alliance (Chicago: University of Chicago Press, 1962), p. 81.

12. David Rosenberg, "The Origins of Overkill: Nuclear Weapons and American Strategy, 1945-1960," International Security 7, No. 4 (Spring 1983), pp. 21-26.
13. The North Atlantic Council established force goals at Lisbon of 50 ground divisions, 4000 aircraft and 704 major surface combatants for 1952; 75 ground divisions and 6500 aircraft for 1953; and 96 ground divisions and 9000 aircraft for 1954.
14. Schmidt, Defense or Retaliation, p. 75.
15. Quoted in John Lewis Gaddis, Strategies of Containment: A Critical Appraisal of Postwar American National Security Policy (New York: Oxford University Press, 1982), p. 167 and p. 149.
16. For an excellent historical analysis of U.S. nuclear doctrine and the growth of the U.S. arsenal see Rosenberg, "The Origins of Overkill," pp. 3-71.
17. Quoted in Stephen Jurika Jr., ed., From Pearl Harbor to Vietnam: The Memoirs of Admiral Arthur W. Radford (Stanford: Hoover Institution Press, 1980), p. 212.
18. Charles Donnelly, U.S. Defense Policies in 1957 (Washington, D.C.: Government Printing Office, 1958), p. 121.
19. William Kaufmann, The McNamara Strategy (New York: Harper and Row, 1964), p. 13.
20. Lieutenant General Leslie Groves, Military Review, July 1950, p. 110.
21. General Matthew Ridgway, Military Review, December 1955, p. 51.
22. Colonel M.A. Solomon, "Dispersion is Not the Answer," Military Review, June 1951, p. 43.
23. Lieutenant General James M. Gavin, War and Peace in the Space Age (New York: Harper and Brothers, 1958), p. 133. See also "The Hidden Struggle for the H-Bomb," Fortune, May 1953, p. 109.
24. John P. Rose, The Evolution of U.S. Army Nuclear Doctrine, 1945-1980 (Boulder: Westview Press, 1980), p. 84.
25. FM-21-6, "How To Prepare and Conduct Military Training" (Washington, D.C.: Government Printing Office, 1975), p. 82.

26. Rose, The Evolution of U.S. Army Nuclear Doctrine, p. 85.
27. FM 100-31, "Tactical Use of Atomic Weapons" (Washington, D.C.: Department of the Army, 1951), pp. iii-iv.
28. The Army's nine principles of war are objective, offensive, simplicity, unit of command, mass, economy of force, maneuver, security and surprise.
29. Program of Instruction for Command and General Staff Officer Course: 1952-1953 (Fort Leavenworth: U.S. Army CGSC, 1952).
30. Vannevar Bush, Modern Arms and Free Men (New York: Simon and Schuster, 1949), p. 106.
31. M. Leitenberg, "Background Information on Tactical Nuclear Weapons," in Tactical Nuclear Weapons: European Perspectives, ed. Frank Barnaby (New York: Crane, Russak and Co., 1978), pp. 131-136.
32. Schmidt, Defense or Retaliation, p. 18.
33. Bernard Brodie, War and Politics (New York: Macmillan Publishing, 1973), p. 394.
34. Leitenberg, "Background Information on Tactical Nuclear Weapons," p. 13.
35. Peter Calvocoressi, Survey of International Affairs, 1952 (London: Oxford University Press, 1955), pp. 36-41; The Economist, 22 November 1952, p. 539. France was involved in a costly war in Indochina as well which diverted limited resources otherwise available for NATO forces. The United States was already providing a tremendous amount of assistance, monetary and equipment, to the French in Indochina.
36. New York Times, 18 December 1954, pp. 1-2.
37. The goal of 48 divisions represented even less of a NATO contribution than first thought. The Lisbon goal of 96 divisions did not include ground forces of Greece or Turkey. The revised goal of 48 divisions included the manpower of both Greece and Turkey.
38. The North Atlantic Treaty Organization: Facts and Figures (Brussels: NATO Information Service, 1981), pp. 137-138.

39. Richard Rosecrance, Defense of the Realm: British Strategy in the Nuclear Epoch (New York: Columbia University Press, 1968), pp. 167-168. See also Roger Hilsman, "NATO: The Developing Strategic Context," in NATO and American Security, ed. Klaus Knorr (Princeton University Press, 1959), pp. 24-34; Charles Murphy, "Defense and Strategy," Fortune, December 1953, pp. 81-82.

40. Dwight D. Eisenhower, The White House Years, vol. I: Mandate for Change (Garden City: Doubleday and Company, 1963), p. 453. The Joint Chiefs of Staff--Admirals Radford and Carney, and Generals Shepard, Ridgway and Twining--supported the President's defense policy recommendations as much out of their tremendous respect for the new Commander-in-Chief as any substantive military reasoning. Until his appointment as Chairman of the JCS, Admiral Radford had been a strong advocate of balanced conventional forces. He states in his memoirs that during the period from 1946 to 1950 President Truman and Secretary of State Marshall "placed much more importance on our atomic airpower than was justified at the time." Yet, with considerably larger conventional forces in-being in 1953, Radford was willing to accept the atomic airpower strategy proposed by Eisenhower despite the impending large reductions in Navy and Army manpower. Army Chief of Staff Ridgway, in particular, was not pleased with the proposed reductions of Army forces. Nevertheless, he acquiesced to the New Look force structure put forth by the JCS without criticism until his retirement in 1955. See Jurika, From Pearl Harbor to Vietnam, pp. 317-338; Matthew Ridgway, Soldier: The Memoirs of Matthew B. Ridgway (New York: Harper and Brothers, 1956).

41. New York Times, 13 July 1956, p. 1.

42. Ibid., p. 1, 8.

43. New York Times, 25 June 1956, p. 22. See also Washington Post, 3 August 1956, p. 10.

44. Facts on File XVII, No. 850 (7-13 February 1957), p. 47. See also New York Times, 28 September 1956, p. 1; Osgood, NATO: The Entangling Alliance, p. 128. Thus, by the fall of 1956 the three major NATO-Europe governments had abdicated their Lisbon pledges and announced significantly lower conventional force levels than originally conceived. The deployment of TNW to Europe was influential in the German's decision, but by no means decisive. TNW deployment was only a minor factor in the French and British decisions to reduce conventional forces.

45. Nikita Khrushchev, Khrushchev Remembers, trans. Strobe Talbott (Boston: Little, Brown and Co., 1970), pp. 514-516.
46. See Leitenberg, "Background Information on Tactical Nuclear Weapons," p. 75; Hilsman, "NATO: The Developing Strategic Context," p. 25; Thomas Wolfe, Soviet Power and Europe: 1945-1970 (Baltimore: Johns Hopkins Press, 1970), p. 183.
47. Major N. Kopov, "The Employment of Atomic Artillery," Military Herald (USSR), No. 3 (March 1955), p. 77.
48. Col. Y. Kosorukov and LT Col. V. Matsulenko, Military Herald (USSR), No. 7 (July 1955), p. 92.
49. Soviet note dated 27 April 1957. Quoted in Wolfe, Soviet Power in Europe, p. 143.
50. Khrushchev, Khrushchev Remembers, p. 517.
51. U.S., Congress, Senate Committee on Foreign Relations, Executive Sessions of the Senate Foreign Relations Committee Vol. XI, 86th Congs., 1st sess., 1959, p. 36 (emphasis added).
52. As of August 1959, 42 of 95 ICBM/IRBM test firings were classified as failures or partial failures. See US News and World Report, 3 August 1959, p. 52.
53. Albert Wohlstetter, "The Delicate Balance of Terror," Foreign Affairs XXXVII, No. 1 (January 1959), pp. 227-228.
54. Schmidt, Defense or Retaliation, p. 27. For an excellent analysis of the Thor/Jupiter production and deployment process see Michael Armacost, The Politics of Weapons Innovation: The Thor-Jupiter Controversy (New York: Columbia University Press, 1969).
55. Quoted in Glenn H. Snyder, Deterrence and Defense: Toward a Theory of National Security (Princeton: Princeton University Press, 1961), p. 124.
56. Ibid.
57. See General Norstad's testimony in U.S., Congress, House, Committee on Appropriations, Mutual Security Appropriations for 1959, Hearings Before the House Committee on Appropriations, 85th Cong., 2nd sess., 1959, pp. 563-564.

58. Raymond Aron, The Great Debate: Theories of Nuclear Strategy, trans. Ernst Pawel (New York: Doubleday and Co., 1965), p. 23.
59. Schmidt, Defense or Retaliation, p. 11 (emphasis added).
60. Robert Osgood, Limited War: The Challenge to American Strategy (Chicago: University of Chicago Press, 1957); Henry Kissinger, Nuclear Weapons and Foreign Policy (New York: Harper Brothers, 1957); LT Gen. James Gavin, War and Peace in the Space Age; Maxwell Taylor, The Uncertain Trumpet (New York: Harper Brothers, 1959).
61. Osgood, NATO: The Entangling Alliance, p. 144.
62. Nathan Twining, Neither Liberty Nor Safety: A Hard Look at U.S. Military Policy and Strategy (New York: Holt, Rinehart and Winston, 1966), p. 5.
63. Quoted in Leitenberg, "Background Information on Tactical Nuclear Weapons," p. 12. For a brief and readable discussion of the technical differences between "atomic" and "thermonuclear" weapons see Samuel Glasstone and Philip J. Dolan, ed., The Effects of Nuclear Weapons (Washington, D.C.: Government Printing Office, 1977), Chapter 1.
64. Letter to the Easterbrook Committee, Subject: 1955-1956 Instruction in Tactical Employment of Atomic Weapons (Fort Leavenworth: USA CGSC, 20 September 1954).
65. Rose, The Evolution of U.S. Army Nuclear Doctrine, pp. 88-89.
66. USA CGSC Library, "Infantry Division in the Attack," 1952; US Army CGSC RB 100-30, Vol. 3, "Tactical Nuclear Operations" (Fort Leavenworth: US Army CGSC, 1976), Chapter 1.
67. General Maxwell Taylor, Military Review (June 1957), p. 35.
68. General Matthew Ridgway, Military Review (December 1955), p. 51.
69. Taylor, The Uncertain Trumpet, p. 49.
70. Ibid., p. 52.

71. Alain Enthoven and K. Wayne Smith, How Much Is Enough: Shaping the Defense Program, 1961-1969 (New York: Harper and Row, 1971), pp. 120-121.
72. Hilsman, "NATO: The Developing Strategic Context," p. 26. For a more detailed description of "Carte Blanche" see Kissinger, Nuclear Weapons and Foreign Policy, pp. 291-297.
73. LT General James M. Gavin, Military Review (June 1956), p. 18; General Maxwell Taylor, Military Review (June 1957), p. 35; LT General Arthur G. Trudeau, Military Review (October 1958), p. 43; General Lyman L. Lemnitzer, Military Review (December 1958), p. 49. Emphasis added in all quotes.
74. Rose, The Evolution of U.S. Army Nuclear Doctrine, pp. 99-100.
75. Schmidt, Defense or Retaliation, p. 188 and 212.
76. The horrors of dying by "vaporization" had been discussed in great detail after 1945. "The atomic bomb, like the 15-inch gun, does no more to those it reaches than is done when someone hits them over the head with an iron bar. There are no degrees of deadness so that the 'vaporization' of which so much has been heard when the atomic bomb is used, is beside the point. A person who has been vaporized is no more dead than a person who has been hit hard enough on the head with an iron bar." Major O. Stewart, "Atoms and Air Forces," Military Review (February 1946), p. 90. The fear of dying by vaporization is as evident today as in 1946, witness the "popularity" of the film "The Day After," shown on nationwide television 20 November 1983.
77. The JSOP is the mid-range planning document which estimates force requirements and strategies for the U.S. 4-6 years in advance.
78. Taylor, The Uncertain Trumpet, p. 38.
79. Memorandum for Members of the Armed Forces Policy Council from Secretary of Defense Charles Wilson, dated 26 November 1956. Subject: Clarification of Roles and Missions to Improve the Effectiveness of Operation of the Department of Defense. Reprinted in Donnelly, U.S. Defense Policies in 1957, pp. 113-117.
80. Armacost, The Politics of Weapons Innovation, pp. 167-168.

81. U.S., Congress, Senate, Committee on Armed Services, Inquiry Into Satellite and Missile Programs, Hearings Before the Senate Committee on Armed Services, 85th Cong., 2nd sess., 1957-1958, p. 2053.
82. Dwight D. Eisenhower, Mandate for Change, p. 457.
83. U.S., Congress, House, Committee on Appropriations, Defense Appropriations for 1964, Hearings Before the House Committee on Appropriations, 88th Cong., 1st sess., Part 1, 1963, pp. 330-331.
84. See Bernard Brodie, Escalation and the Nuclear Option (Princeton: Princeton University Press, 1966); Edouard Le Ghait, No Carte Blanche to Capricorn: The Folly of Nuclear War Strategy (New York: Bookfield House, 1960); Herman Kahn, On Escalation: Metaphors and Scenarios (New York: Praeger Publishers, 1965); Thomas Schelling, The Strategy of Conflict (Cambridge: Harvard University Press, 1960); John Strachey, On the Prevention of War (New York: St. Martin's Press, 1962).
85. Quoted in Russell Weigley, History of the United States Army (New York: Macmillan, 1967), p. 538.
86. Saturday Review, 3 September 1960, p. 17.
87. See Enthoven and Smith, How Much Is Enough, pp. 125-130; Kaufmann, The McNamara Strategy, Chapters 1-2; Robert McNamara, The Essence of Security (London: Hodder and Stoughton, 1968), Chapters 3-4; Melvin Laird, A House Divided: America's Strategy Gap (Chicago: Henry Regnery Co., 1962), Chapters 3-5.
88. Norman Polmar, Strategic Weapons: An Introduction (New York: Crane, Russak and Co., 1982), p. 23 and p. 34. The advent of Polaris was a mixed blessing for the Europeans. The covert operations of the SSBN enhanced survivability and stability of the nuclear deterrent. However, many believed it decreased the importance of a forward defense in Europe proper. The Europeans worried that a NATO-assigned SSBN would ultimately weaken support in the U.S. for maintaining ground forces in Europe.
89. Enthoven and Smith, How Much Is Enough, p. 117.
90. New York Times, 29 March 1961, p. 16.
91. New York Times, 15 May 1961, p. 10.

92. New York Times, 2 June 1961, p. 1.
93. Helmut Schmidt, The Balance of Power: Germany's Peace Policy and the Superpowers, trans. Edward Obe (London: William Kimber, 1971), p. 78.
94. Rudi Riedel, "Offensive Doctrine of the Soviet Army," Military Review, November 1962, p. 61.
95. Anonymous French author, "The Adaption of Soviet Ground Forces to Nuclear War," Military Review, September 1966, p. 11.
96. Walter Lippmann, The Coming Tests With Russia (Boston: Little, Brown and Co., 1961), pp. 9-10.
97. General L.J. Puloch (French Army), "The Future of the French Army," Military Review, November 1964, p. 42.
98. Strachey, On the Prevention of War, pp. 94-95.
99. Bernard Brodie, War and Politics (New York: Macmillan Publishing, 1973), p. 400.
100. U.S., Congress, House, Committee on Appropriations, Defense Appropriations for 1962, Hearings Before the House Committee on Appropriations, 87th Cong., 1st sess., 1961, pp. 18-19.
101. Andre Beaufre, NATO and Europe, trans. Joseph Green (New York: Vintage Books, 1966), pp. 70-71.
102. Discussion and data of OSD systems analysis estimates derived from Enthoven and Smith, How Much Is Enough, pp. 134-150.
103. The systems analysis claims of NATO qualitative tactical air superiority was disputed by General Nathan Twining. He pointed out that "all of the combat aircraft in the fighting inventory in 1965 were conceived, designed, and initial production funding approved before the start of the Kennedy Administration." Twining believed that the U.S. was "rapidly approaching an 'airplane gap'." Twining, Neither Liberty Nor Safety, pp. 245-246.
104. Gray, Strategic Studies and Public Policy, p. 104.

105. See Gregory Treverton, "Nuclear Weapons in Europe," Adelphi Paper No. 168 (London: International Institute for Strategic Studies, 1981), p. 33; Lawrence Freedman, "The Dilemma of Theatre Nuclear Arms Control," Survival XXIII, No. 1 (January/February 1981), p. 5.
106. U.S., Congress, House, Committee on Appropriations, Defense Appropriations for 1964, Hearings Before the House Committee on Appropriations, p. 130.
107. U.S., Congress, House, Committee on Armed Services, Military Posture and HR 9637 (no. 36), Hearings Before the House Committee on Armed Services, 88th Cong., 2nd sess., 1964, pp. 7021-7022.
108. Gray, Strategic Studies and Public Policy, p. 56.
109. See Wolfgang Heisenberg, "The Alliance and Europe: Part I: Crisis Stability in Europe and Theatre Nuclear Weapons," Adelphi Paper No. 96 (London: International Institute for Strategic Studies, 1973), pp. 1-5; and Richard Sinnreich, "NATO's Doctrinal Dilemma," Orbis XIX, No. 2 (Summer 1975), pp. 461-476.
110. B. Horton, "U.S. Gives NATO New Nuclear Plan," San Francisco Examiner, 16 October 1968. Discussed in Leitenberg, "Background Information on Tactical Nuclear Weapons," pp. 18-19.
111. Marc Geneste, "The City Walls: A Credible Defense Doctrine for the West," Orbin XIX, No. 2 (Summer 1975), p. 481.
112. U.S., Congress, House, Committee on Appropriations, Defense Appropriations for 1964, pp. 330-331.
113. U.S., Department of Defense, Annual Report of the Secretary of the Army, FY 1960 (Washington, D.C.: Government Printing Office, 1960), p. 115.
114. U.S., Congress, Senate, Committee on Foreign Relations, Development in Military Technology and Their Impact on U.S. Strategy and Foreign Policy, study by the Washington Center of Foreign Policy Research (Washington, D.C.: Government Printing Office, 1959), p. 78.
115. U.S., Congress, Senate, Preparedness Investigating Subcommittee of the Committee on Armed Services and Committee on Aeronautical and Space Sciences, Joint Hearings on Missile and Space Activities, 86th Cong., 1st sess., 1959, p. 43.

116. U.S., Department of Defense, Annual Report of the Secretary of the Army, FY 1961 (Washington, D.C.: Government Printing Office, 1962), p. 59.
117. Data contained in U.S. Department of Defense, Annual Report of the Secretary of Defense, FY 1957 and FY 1961 (Washington: Government Printing Office, pp. 94-96 and pp. 71-73 respectively).
118. U.S., Department of Defense, Annual Report of the Secretary of the Army, FY 1962 (Washington, D.C.: Government Printing Office, 1963), p. 99 (emphasis added).
119. See U.S. Department of Defense, Annual Report of the Secretary of Defense, FY 1962 and FY 1964 (Washington, D.C.: Government Printing Office), pp. 106-110 and pp. 110-113 respectively.
120. The information on Army training and the CGSC curriculum is drawn from John P. Rose, U.S. Army, "U.S. Army Doctrinal Developments: The Nuclear Battlefield 1945-1977," (Ph.D. dissertation, University of Southern California, 1977) and S.T. Cohen and William Van Cleave, Tactical Nuclear Weapons: An Examination of the Issues (New York: Crane, Russak and Co., 1978), pp. 5-7.
121. U.S., Department of Defense, Annual Report of the Secretary of the Army, FY 1968 (Washington, D.C.: Government Printing Office, 1971), p. 147.
122. U.S., Department of Defense, Annual Report of the Secretary of Defense, FY 1964, p. 3.
123. See Lawrence Freedman, "Europe Between the Superpowers," in Gerald Segal et al., Nuclear War and Nuclear Peace (New York: St. Martin's Press, 1983), pp. 88-94.
124. Rose, The Evolution of U.S. Army Doctrine, p. 57 and p. 78.
125. FM 61-100, "The Division" (Washington, D.C.: Department of the Army, 1962), p. 4 (emphasis added).
126. U.S., Congress, Senate, Committee on Government Operations, The Atlantic Alliance, Hearings Before the Committee on Government Operations, 89th Cong., Part 2, 1966, p. 29. Contrast with Secretary Clifford's proposal for a demonstration burst discussed on p. 50.

127. U.S., Congress, House, Document No. 54, Message of the President of the United States Relative to the State of Our Defenses, 89th Cong., 1st sess., 1965, pp. 3-8.
128. James Schlesinger, "Organization Structures and Planning," in Roland McKean, ed., Issues in Defense Economics (New York: Columbia University Press, 1967), p. 209.
129. "Army Fires Sergeant As Field Use Nears," Aviation Week and Space Technology, 12 November 1962, pp. 82-89; "Military Notes: First Pershing Millile Battalion," Military Review, September 1962, p. 101.
130. Schmidt, Defense or Retaliation, p. 55.
131. Richard Burt, "The Hidden Nuclear Crisis in the Atlantic Alliance," in NATO's Strategic Options, ed. David Yost (New York: Pergamon Press, 1981), p. 48.
132. Quoted in Congressional Record, 18 May 1971, p. S7217.
133. John Newhouse, U.S. Troops in Europe: Issues, Costs and Choices (Washington, D.C.: Brookings Institution, 1971), p. 44.
134. Schmidt, The Balance of Power, p. 197. Compare with McNamara's statement in 1963 on p. 48.
135. Helmut Schmidt, "The 1977 Alastair Buchan Memorial Lecture," Survival 20 (January/February 1978), p. 3. See also David Yost, "European Security and the SALT Process," The Washington Papers IX, No. 85 (Beverly Hills: Sage Publications, 1981), pp. 10-18.
136. See Jeffrey Record, "Theatre Nuclear Weapons: Begging the Soviet Union to Preempt," Survival XIX, No. 5 (September/October 1977), p. 208.
137. Henry Kissinger, White House Years (Boston: Little, Brown and Co., 1979), p. 1152. For a brief but concise description of the APNW see Alexander George, Managing U.S.-Soviet Rivalry: Problems of Crisis Prevention (Boulder: Westview Press, 1983), pp. 107-118.
138. See Uwe Nerlich, "Some Comments on Modernization of Nuclear Stockpiles in Europe: A German View," HI-1626-D (Croton-on-Hudson: Hudson Institute, 1972); Brig. General E.F. Black, "NATO's Unmentionable Option, Tactical Nuclear Weapons," Congressional Record, 30 December 1970, p. E-10880; W. Beecher, "Over the Threshold: Clean Tactical Nuclear Weapons for Europe," Army XXII, No. 7 (July 1972).

139. NATO Nuclear Planning Group, Final Communique, Press Release M-NPG-1(73)17 (Brussels: NATO Press Service, 16 May 1973), pp. 1-2.
140. See U.S., Congress, House, Senate, Joint Committee on Atomic Energy, Military Applications of Nuclear Technology, Hearings Before the Joint Committee on Atomic Energy, 93rd Cong., 1973, Parts 1-3; U.S., Congress, Senate, Committee on Foreign Relations, Staff Report, U.S. Security Issues in Europe: Burden Sharing and Offset, MBFR and Nuclear Weapons, 93rd Cong., 1973; U.S., Congress, Senate, Committee on Foreign Relations, Nuclear Weapons and Foreign Policy, Hearings Before the Senate Committee on Foreign Relations, 93rd Cong., 1974.
141. U.S., Department of Defense, Secretary of Defense J.R. Schlesinger, The Theatre Nuclear Force Posture in Europe, A Report to the U.S. Congress in Compliance With Public Law 93-365, reprinted in Tactical Nuclear Operations, RB 101-31 (Fort Leavenworth: U.S. Army CGSC, 1980), p. 1-5.
142. Ibid., p. 1-15.
143. Ibid., p. 1-18 (emphasis added).
144. LT Col. Klaus Reinhardt, "Problems of Employing Nuclear Weapons Considering the Special Situation of the Federal Republic of Germany," in Tactical Nuclear Operations, RB 101-31, p. 7-9.
145. Schlesinger, The Theatre Nuclear Force Posture, p. 1-17.
146. Federal Minister of Defense, White Paper 1975/1976: The Security of the Federal Republic of Germany and the Development of the Federal Armed Forces (Bonn: Press and Information Office of the Federal Republic of Germany, 1976), p. 20.
147. U.S., Department of Defense, Report of the Secretary of Defense James R. Schlesinger to the Congress on the FY 1975 Defense Budget and FY 1975-1979 Defense Program (Washington, D.C.: Government Printing Office, 1974), pp. 42-44.
148. Ibid., p. 82.

149. U.S., Department of Defense, Report of the Secretary of Defense Donald H. Rumsfeld to the Congress on the FY 1977 Defense Budget and Its Implications for the FY 1978 Authorization Request and the FY 1977-1981 Defense Programs (Washington, D.C.: Government Printing Office, 1976), pp. 82-83.
150. Reinhardt, "Problems of Employing Nuclear Weapons," p. 7-2.
151. FM 100-5, "Operations" (Washington, D.C.: Department of the Army, 1976), p. 2-2. FM 100-5 is the Army Field Manual which "sets forth the basic concepts of U.S. Army doctrine" and "form the foundation for what is taught in our service schools, and guide for training and combat developments throughout the Army."
152. FM 100-30 (Test), "Tactical Nuclear Operation" (Washington, D.C.: Department of the Army, 1971), p. 2-1.
153. For a brief discussion of FM 100-30 (Test) see Rose, The Evolution of U.S. Army Nuclear Doctrine, pp. 103-107.
154. FM 100-5, p. 2-28 (emphasis added).
155. FM 6-20, "Fire Support in Combined Arms Operations" (Washington, D.C.: Department of the Army, 1977), pp. 6-2 to 6-3 (emphasis added).
156. FM 100-5, p. 10-7.
157. Ibid, pp. 10-7 to 10-8. See also FM 6-20, p. 6-5.
158. RB 100-30, Vol. 1, "Tactical Nuclear Operations-Docctrine" (Fort Levenworth: U.S. Army Combined Arms Center, 1976), p. 2-1.
159. Ibid.
160. U.S., Department of Defense, Report of the Secretary of Defense Donald H. Rumsfeld to the Congress on the FY 1977 Defense Budget, p. 219.
161. Report of the President's Commission on Strategic Forces, Brent Scowcroft, Chairman (Washington, D.C.: Government Printing Office, 1983), p. 2.
162. Zbigniew Brzezinski, Power and Principle: Memoirs of the National Security Advisor (New York: Farrar, Straus and Giroux, 1983), p. 304.

163. In reality, the enhanced radiation warhead is not a recent development. Dr. Edward Teller began explaining the possibilities of such a weapon to government officials, including President Eisenhower, in 1957. In an October 1957 Foreign Affairs article, Secretary of State John Foster Dulles claimed that tests pointed "to the possibility of possessing nuclear weapons, the destructiveness and radiation effects of which can be substantially confined to predetermined targets." Extensive Congressional debates on the ERW were held between 1958 and 1962. See John Foster Dulles, "Challenge and Response in United States Policy," Foreign Affairs (October 1957), p. 31 and S.T. Cohen, The Neutron Bomb: Political, Technological and Military Issues (Washington, D.C.: Institute for Foreign Policy Analysis, 1978), pp. 5-34.
164. Quoted in Cohen, The Neutron Bomb, p. 160. Bahr is also opposed to the Pershing II/Ground Launched Cruise Missile deployment in Europe.
165. The French apparently had their own ERW research and development program during this period. First component testing of a French ERW was conducted on 26 June 1980 at Muroroa Atoll in the South Pacific. The ERW is reportedly being considered for the French Hades tactical nuclear missile which will replace the Pluton in the late 1980's.
166. Quoted in Cohen, The Neutron Bomb, p. 51. For a brief insider's discussion of the events leading to Carter's 7 April decision see Brzezinski, Power and Principle, pp. 301-306; Cyrus Vance, Hard Choices (New York: Simon and Schuster, 1983), pp. 67-69 and pp. 92-96. Carter's own explanation can be found in his memoirs, Keeping Faith (New York: Bantam Books, 1982), pp. 225-229.
167. Brzezinski, Power and Principle, p. 301. See also Cohen, The Neutron Bomb, pp. 53-55.
168. Quoted in Robert Pranger and Roger Labrie, ed., Nuclear Strategy and National Security: Points of View (Washington, D.C.: American Enterprise Institute for Public Policy Research, 1977), p. 338. The volume contains an abridged version of the Senate debate. For full coverage see Congressional Record, 1 July 1977, pp. S11429-S11439 and 13 July 1977, pp. S11742-S11768.
169. Ibid., p. 337.

170. Ibid., p. 351.
171. See, for instance, FM 101-31-1, "Staff Officers Field Manual: Nuclear Weapons Employment Doctrine and Procedures" (Washington, D.C.: Department of the Army, 1977).
172. Cohen, The Neutron Bomb, p. 61.
173. U.S., Department of Defense, Soviet Military Power, 2nd ed. (Washington, D.C.: Government Printing Office, 1983), pp. 78-80. On 6 August 1981, President Reagan authorized production of the ERW for Lance and the 8-inch artillery shell. In July 1983, the Senate canceled previously approved funds for development of a 155mm enhanced radiation artillery shell. All ER weapons are being stockpiled solely in the U.S.
174. Yost, "European Security and the SALT Process," p. 16.
175. The terms high- and low-yield are not used arbitrarily. The JCS defines five categories of nuclear yields: Very Low: less than 1 kiloton(kt), Low: 1-10kt, Medium: 11-50kt, High: 51-500kt, Very High: greater than 500kt. U.S., Department of Defense, Joint Chiefs of Staff, JCS Pub. 1, "Dictionary of Military and Associated Terms" (Washington, D.C.: Government Printing Office, 1979), p. 239.
176. Richard Burt, "NATO and Nuclear Deterrence," an address before the Arms Control Association Conference in Brussels, Belgium, 23 September 1981, reprinted in Jeffrey Porro and Marsha Olive, ed., Nuclear Weapons in Europe: Modernization and Limitation (Lexington: Lexington Books, 1983), p. 117.
177. Schmidt, Defense or Retaliation, p. 27.
178. U.S., Department of Defense, Report of the Secretary of Defense Casper W. Weinberger to the Congress on the FY 1984-88 Defense Programs (Washington, D.C.P Government Printing Office, 1983), pp. 232-233. The term intermediate nuclear force (INF) is interchangeable with TNF (theatre nuclear force). MIRV is multiple, independently targetable reentry vehicle, referring to the three nuclear warheads per SS-20 missile.
179. The SS-20 is a two-stage version of the three-stage, mobile SS-16 ICBM. Under SALT II, the Soviet Union is obliged "not to produce, test, or deploy ICBMs

of the SS-16 type," while SS-20 production and deployment is unrestricted. For many European analysts it appeared the U.S. had negotiated for U.S. security alone at the expense of the Europeans, making the SS-20 arsenal all the more threatening. See U.S., Department of State, SALT II Agreement, Vienna, 18 June 1979, Selected Documents No. 12A (Washington, D.C.: Government Printing Office, 1979), pp. 16-16 and Article IV, para. 8, p. 34.

180. Quoted in Cohen and Van Cleave, Tactical Nuclear Weapons, p. 8.
181. Raymond Garthoff, "The NATO Decision on Theatre Nuclear Forces," Political Science Quarterly 98, No. 2 (Summer 1983), p. 205.
182. NATO Communique, 12 December 1979, reprinted in North Atlantic Treaty Organization, Facts and Figures, pp. 294-296. The NATO minister's coupling of the 1000 warhead withdrawal to the LRTNF program is somewhat misleading. One month earlier the U.S. had announced a decision to unilaterally withdraw 1000 warheads from Europe, curiously following a Soviet announcement to unilaterally withdraw 20,000 troops and 1000 tanks from East Germany. The combination of "unilateral" announcements was a variant of a proposal tabled at the Mutual and Balanced Force Reduction (MBFR) talks, called Option III, in 1975.
183. U.S., Department of Defense, Annual Report FY 1979 (Washington, D.C.: Government Printing Office, 1979), pp. 67-68 (emphasis added).
184. Federal Minister of Defense, White Paper 1979: The Security of the Federal Republic of Germany and the Development of the Federal Armed Forces (Bonn: Press and Information Office of the Federal Republic of Germany, 1979), p. 111 (emphasis added).
185. U.S., Department of Defense, Annual Report FY 1981 (Washington, D.C.: Government Printing Office, 1981), p. 95.
186. U.S., Department of Defense, Report of the Secretary of Defense Casper W. Weinberger to the Congress on the FY 1983 Budget, FY 1984 Authorization Request, and FY 1983-87 Defense Programs (Washington, D.C.: Government Printing Office, 1982), p. I-18 (emphasis added).

187. U.S., Department of Defense, Report of the Secretary of Defense Casper W. Weinberger to the Congress on the FY 1984 Budget, pp. 51-52.
188. Quoted in Robert Scheer, With Enough Shovels: Reagan, Bush and Nuclear War (New York: Random House, 1982), p. 131.
189. Ibid., p. 6.
190. Vice President George Bush, "Peace and Security in Europe," address in West Berlin, 31 January 1983, U.S., Department of State, Current Policy Series, No. 449 (Washington, D.C.: Government Printing Office, 1983), p. 2.
191. U.S., Department of Defense, Report of the Secretary of Defense Casper W. Weinberger to the Congress on the FY 1984 Budget, p. 51.
192. For example, see Franz-Josef Schulze et al., "Nuclear Weapons and the Preservation of Peace," Foreign Affairs 60, No. 5 (Summer 1982) and Francois de Rose, "Updating Deterrence in Europe: Inflexible Response?" Survival XXIV, No. 1 (January/February 1982).
193. Strachey, On the Prevention of War, p. 112.
194. Ibid. See also George Kennan et al., "Nuclear Weapons and the Alliance," pp. 1157-1170.
195. Phillip A. Karber, "The Battle of Unengaged Military Strategies," in Uwe Nerlich, ed., The Soviet Asset: Military Power in the Competition Over Europe (Cambridge: Ballinger Publishing, 1983), p. 214.
196. For an excellent description of "Deep Strike" strategy see Don Cotter, "Potential Future Roles for Conventional and Nuclear Forces in Defense of Western Europe," in Report of European Security Study, Strengthening Conventional Deterrence in Europe (New York: St. Martin's Press, 1983), pp. 209-253. A brief but superb description of SPGMs and related technologies can be found in Benjamin Schemmer, "NATO's New Strategy: Defend Forward, But Strike Deep," Armed Forces Journal International (November 1982), pp. 50-68. Jeffrey Record presents a balanced critique of the "Deep Strike" initiative in "NATO's Forward Defense and Striking Deep," Armed Forces Journal International (November 1983), pp. 42-48.

197. General Bernard Rogers, "The Strike Deep Initiative," Armed Forces Journal International (January 1983), p. 5 (emphasis added).
198. Christian Science Monitor, 8 December 1982, p. 14.
199. For an analysis of the 1984-1988 French and British defense programs see Robert Rudney, "Mitterand's Defense Concepts: Some Unsocialist Earmarks," Strategic Review XI, No. 2 (Spring 1983), pp. 20-35; Anthony Cordesman, "France's Accelerating Shift Towards a Nuclear Trigger Force," Armed Forces Journal International (June 1983), pp. 78-80; Cordesman, "British Defense: A Time For Hard Choices," Armed Forces Journal International (September 1983), pp. 58-68.
200. Deborah Kyle, "Army Lags Behind Other Services in Past Six Authorization Bills," Armed Forces Journal International (September 1983), p. 9.
201. FM 100-5, "Operations" (Washington, D.C.: Department of the Army, 1982). The 1976 and 1982 versions of the manual will be distinguished in the text by the year following the FM, i.e., FM 100-5 (1976) and FM 100-5 (1982).
202. Huba Wass de Czege and L.D. Holder, "The New FM 100-5," Military Review, July 1982, p. 53.
203. Schemmer, "NATO's New Strategy," p. 62.
204. FM 100-5 (1982), p. 2-1. For description of the indirect approach see Liddell Hart, Strategy: The Indirect Approach (New York: Praeger Publishers, 1954) and idem, Defense of the West (New York: William Morrow and Co., 1950), pp. 220-221.
205. General Bernard Rogers, "Greater Flexibility for NATO's Flexible Response," Strategic Review XI, No. 2 (Spring 1983), p. 17.
206. FM 100-5 (1982), p. 7-13. See also T.A. Meyers, "NATO: Can the Alliance Be Saved?" Armed Forces Journal International (November 1983), pp. 38-40.
207. U.S., Department of Defense, Annual Report FY 1984, p. 232 (emphasis added).

208. As late as September 1983, four of sixteen Pershing II test flights had failed. See "The Pershing Missile Fails Another Test," Newsweek, 8 August 1983, p. 28.
209. Richard Betts, Surprise Attack: Lessons for Defense Planning (Washington, D.C.: Brookings Institution, 1982), p. 241.
210. Gerald Segal et al., Nuclear War and Nuclear Peace, p. 1.
211. General Robert Close, Europe Without Defense: 48 Hours That Could Change The Face of the World (New York: Pergamon Press, 1979), p. xiv.
212. General Bernard Rogers, "The Atlantic Alliance: Prescriptions for a Difficult Decade," Foreign Affairs 60, No. 5 (Summer 1982), p. 1152.
213. Interview with General Bernard Rogers by Armed Forces Journal, 13 July 1983, published September 1983.
214. Deborah G. Meyer, "The British Army of the Rhine: New Tactics, Same Commitment," Armed Forces Journal International (May 1983), p. 56.
215. Robert Shishko, "The European Conventional Balance: A Primer," Rand Paper P-6707 (Santa Monica: Rand Corporation, 1981), p. 13.
216. Benjamin Schemmer, "U.S. Tanks Can't Kill Russia's Latest Ones in Head-On Combat," Armed Forces Journal International (August 1983), p. 30.
217. See Lawrence Freedman, "NATO Myths," Foreign Policy 45 (Winter 1981/1982), pp. 50-52.
218. North Atlantic Assembly's Special Committee on Nuclear Weapons in Europe, Second Interim Report on Nuclear Weapons in Europe, Report to the Committee on Foreign Relations, U.S. Senate, 98th Cong., 1st sess., 1983, p. 7. See also James Thompson, "NATO Strategy: The Challenges of the Next Four Years," Rand R-2836-FF (Santa Monica: Rand Corporation, 1982), pp. 108-128.
219. U.S., Department of Defense, Report of the Secretary of Defense Casper W. Weinberger to the Congress on the FY 1984 Budget, p. 56.
220. General Alexander Haig, speech reprinted in Survival XIX, No. 1 (January/February 1977), p. 34.

221. Thomas C. Schelling, Arms and Influence (New York: Yale University Press, 1966), p. 112. See Chapter 3 in Schelling's book for his discussion of risk and bargaining theory in conflict. See also his earlier work, The Strategy of Conflict (New York: Oxford University Press, 1960), pp. 21-80.
222. Ibid., p. 94 (emphasis added).
223. Barry Schneider, "U.S. Tactical Nuclear Weapons: A Controversial Arsenal," in Barry Johnson and Barry Schneider, ed., Current Issues in U.S. Defense Policy (New York: Praeger Publishers, 1976), p. 186.
224. Ibid., pp. 186-188.
225. Glasstone and Dolan, The Effects of Nuclear Weapons, p. 520.
226. Quoted in Schneider, "U.S. Tactical Nuclear Weapons," p. 186.
227. Joseph Douglass, Jr., The Soviet Theatre Nuclear Offensive (Washington, D.C.: Government Printing Office, 1982), p. 5.
228. Ibid., p. 8.
229. U.S., Congress, Senate, Subcommittee on U.S. Security Agreements and Commitments Abroad and the Subcommittee on Arms Control, International Law and Organization of the Committee on Foreign Relations, U.S. Nuclear Weapons in Europe and U.S.-USSR Strategic Doctrines and Policies, 93rd Cong., 2nd sess., 1974, p. 183.
230. For an excellent discussion of NATO deterrent and war objectives see Kevin Lewis, "Nuclear Weapons Policy, Planning and War Objectives: Toward a Theatre-Oriented Deterrent Strategy," Rand Paper P-6764 (Santa Monica: Rand Corporation, 1982).
231. U.S., Department of Defense Report of the Secretary of Defense Casper W. Weinberger to the Congress on the FY 1984 Budget, p. 34.
232. See earlier text for discussion of these problems.
233. Gray, Strategic Studies and Public Policy, p. 146. See also Robert A. Moore, "Theatre Nuclear Forces: Thinking the Unthinkable," International Defense Review 14 (1981), pp. 401-408.

234. Alton Frye, "Nuclear Weapons in Europe: No Exit From Ambivalence," Survival XXII, No. 3 (May/June 1980), p. 104. See also G. Philip Hughes, "Cutting the Gordian Knot: A Theatre-Nuclear Force For Deterrence in Europe," Orbis 22, No. 2 (Summer 1978), pp. 309-332.
235. Francois de Rose, "Inflexible Response," Foreign Affairs 61, No. 1 (Fall 1982), p. 144. See also idem, "Updating Deterrence in Europe," pp. 19-23.
236. Ole Holsti, Crisis, Escalation, War (Montreal: McGill-Queen's University Press, 1972), pp. 222-225. See also idem, "Historians, Social Scientists, and Crisis Management: An Alternative View," Journal of Conflict Resolution 24 (December 1980), pp. 665-682; Gray, Strategic Studies and Public Policy, pp. 110-113.
237. Genest, "The City Walls," p. 480.
238. Ibid., p. 485. See also Geneste, "European Land Defense," Comparative Strategy, No. 3 (Winter 1980), pp. 239-247.
239. Gallois diverges from Geneste somewhat by calling for a much greater European retaliatory force and negligible conventional forces. See Gallois, "Western Europe: An Improper System of Defense," RUSI Journal (September 1979), pp. 12-17.
240. R. Sandoval et al., "A Defense Force for NATO's Central Region," Los Alamos Report LA-5991-MS (Los Alamos: Los Alamos Scientific Laboratories, 1975).
241. Geneste, "The City Walls," p. 490.
242. Laurence Martin, "Theatre Nuclear Weapons and Europe," Survival XVI (November/December 1974), pp. 268-276.
243. See Colin Gray, "Deterrence and Defense in Europe: Revising NATO's Theatre Nuclear Posture," RUSI Journal (December 1974), pp. 3-11; idem, "Theatre Nuclear Weapons: Doctrines and Postures," World Politics XXVIII, No. 2 (January 1976), pp. 311-313; Major Ronan Ellis, "Beyond Deterrence: A Rational Approach to the Deployment of Tactical Nuclear Weapons in Europe." in Tactical Nuclear Operations, RB 101-31, pp. 9-1 to 9-8.
244. Ellis, "Beyond Deterrence," p. 9-7.

245. Kent F. Wisner, "Military Aspects of Enhanced Radiation Weapons," Survival XXIII, No. 6 (November/December 1981), p. 247.
246. Ibid.
247. A weapon's delivery accuracy is defined as the radius of a circle within which at least half of the weapons impact, the radius being called the circular error probable or CEP.
248. A brief discussion of the theatre C3 systems discussed above can be found in U.S., Department of Defense, Report of the Secretary of Defense Casper W. Weinberger to the Congress on the FY 1984 Budget, pp. 132-137 and pp. 244-251. For an in-depth discussion of the JSTARS program see Benjamin Schemmer, "Pave Mover-JSTARS," Armed Forces Journal International (January 1983), pp. 38-52.
249. James Schlesinger, Foreward to Beyond Nuclear Deterrence: New Aims, New Arms, ed., Uwe Nerlich and Johan Holst (New York: Crane, Russak and Co., 1977), p. xi.
250. John Milton, Paradise Lost, Book VI, 438-669.
251. John Mearsheimer, Conventional Deterrence (Ithaca: Cornell University Press, 1983), p. 168.
252. After a day of deliberations following warning of the attack, not a single alert measure was implemented by the NATO Council of Ministers. The Commander of the U.S. Seventh Army in Germany, General James Polk, was forbidden to move troops, increase aerial reconnaissance, or disperse aircraft in order to avoid sending provocative signals to the Soviets. As Richard Betts points out, "Alliance leaders may have been comforted by Soviet demarches at their respective embassies and the United Nations assuring them that the invasion was purely a local action aimed at Prague. This, however, would be a natural part of the deception plan if the Soviets did intend to wheel westward." See Betts, Surprise Attack, pp. 85-86. See also General James Polk, "Reflections on the Czechoslovakian Invasion, 1968," Strategic Review 5 (Winter 1977), pp. 10-35.
253. Schelling, Arms and Influence, p. 48.

254. On 27 October 1983, NATO defense ministers announced a decision to scrap 1400 nuclear warheads from the NATO arsenal. This followed the 1979 reduction of 1000 warheads. In both cases, the decision to eliminate these weapons was unfortunately tied to generating public support, or alleviating public opposition, to the Pershing II and GLCM deployment.

BIBLIOGRAPHY

BOOKS AND MONOGRAPHS

- Albert, Stuart, and Luck, Edward, ed. On the Endings of Wars. Port Washington: Kennikat Press, 1980.
- Armacost, Michael H. The Politics of Weapons Innovation: The Thor-Jupiter Controversy. New York: Columbia University Press, 1969.
- Aron, Raymond. The Great Debate: Theories of Nuclear Strategy. New York: Doubleday Co., 1964.
- Barnaby, Frank, ed. Tactical Nuclear Weapons: European Perspectives. New York: Crane, Russak and Co., 1978.
- Barzini, Luigi. The Europeans. New York: Simon and Schuster, 1983.
- Beaufre, André. NATO and Europe. New York: Vintage Books, 1966.
- Betts, Richard. Surprise Attack: Lessons for Defense Planning. Washington, D.C.: Brookings Institution, 1982.
- Blackett, P.M.S. Fear, War, and the BOMB. New York: McGraw-Hill, 1948.
- Booth, Ken, and Wright, M., ed. American Thinking About Peace and War. Sussex: Harvester Press, 1978.
- Brodie, Bernard. Strategy in the Missile Age. Princeton: Princeton University Press, 1959.
- _____. Escalation and the Nuclear Option. Princeton: Princeton University Press, 1966.
- Brzezinski, Zbigniew. Power and Principle: Memoirs of the National Security Advisor. New York: Farrar, Straus and Giroux, 1983.
- Buchan, Alastair. NATO in the 1960's. New York: Praeger Publishers, 1960.
- Burrows, Bernard, and Irwin, Christopher. The Security of Western Europe: Towards a Common Defense Policy. London: Charles Knight and Co., 1972.

- Burt, Richard, ed. Arms Control and Defense Postures in the 1980's. Boulder: Westview Press, 1982.
- Buzzard, A. On Limiting Atomic War. London: Royal Institute, 1956.
- Carter, Jimmy. Keeping Faith: Memoirs of a President. New York: Bantam Books, 1982.
- Clark, Ian. Limited Nuclear War. Princeton: Princeton University Press, 1982.
- Close, Robert. Europe Without Defense: 48 Hours That Could Change The Face of The World. New York: Pergamon Press, 1979.
- Cohen, S.T. The Neutron Bomb: Political, Technical and Military Issues. Washington, D.C.P Institute for Foreign Policy Analysis, 1978.
- _____, and Van Cleave, W. Tactical Nuclear Weapons: An Examination of the Issues. New York: Crane, Russak and Company, 1978.
- Collins, John M. U.S. Defense Planning: A Critique. Boulder: Westview Press, 1982.
- _____, and Cordesman, Anthony. Imbalance of Power: Shifting U.S.-Soviet Military Strengths. London: Macdonald and Jane's, 1978.
- Davis, Lynn. "Limited Nuclear Options: Deterrence and the New American Doctrine." Adelphi Paper 121. London: International Institute for Strategic Studies, 1976.
- Douglass, Joseph. Soviet Military Strategy in Europe. New York: Pergamon Press, 1980.
- _____. The Soviet Theatre Nuclear Offensive. Washington, D.C.: Government Printing Office, 1982.
- Eisenhower, Dwight D. The White House Years: Mandate for Change, 1953-1956. Garden City: Doubleday and Co., 1963.
- _____. The White House Years: Waging Peace, 1956-1961. Garden City: Doubleday and Co., 1965.
- Enthoven, Alain, and Smith, K. Wayne. How Much Is Enough: Shaping the Defense Program, 1961-1969. New York: Harper and Row, 1971.
- Freedman, Lawrence. The Evolution of Nuclear Strategy. New York: St. Martin's Press, 1981.

- Furniss, Edgar. France, Troubled Ally. New York: Praeger Publishers, 1960.
- Gaddis, John Lewis. Strategies of Containment: A Critical Appraisal of Postwar American National Security Policy. New York: Oxford University Press, 1982.
- Garthoff, Raymond. Soviet Strategy in the Nuclear Age. New York: Praeger Publishers, 1958.
- Gavin, James M. War and Peace in the Space Age. New York: Harper and Brothers, 1958.
- Gray, Colin. Strategic Studies and Public Policy: The American Experience. Lexington: University of Kentucky, 1982.
- Hahn, Walter, and Neff, J.C., ed. American Strategy for the Nuclear Age. New York: Doubleday and Co., 1960.
- Halperin, Morton. Limited War in the Nuclear Age. New York: Wiley and Sons, 1963.
- _____. Contemporary Military Strategy. Boston: Little, Brown and Co., 1967.
- Hammond, Paul; Schilling, Warner; and Snyder, Glenn. Strategy, Politics, and Defense Budgets. New York: Columbia University Press, 1962.
- Heisenberg, Wolfgang. "The Alliance and Europe: Part 1: Crisis Stability in Europe and Theatre Nuclear Weapons." Adelphi Paper 96. London: International Institute for Strategic Studies, 1973.
- Hobbs, Richard. The Myth of Victory: What is Victory in War? Boulder: Westview Press, 1979.
- Johnson, David, and Schneider, Barry, ed. Current Issues in U.S. Defense Policy. New York: Praeger Publishers, 1976.
- Kahn, Herman. On Thermonuclear War. Princeton: Princeton University Press, 1960.
- _____. Thinking About the Unthinkable. New York: Norizon Press, 1962.
- _____. On Escalation: Metaphors and Scenarios. New York: Praeger Publishers, 1965.
- Kaufmann, William W. The McNamara Strategy. New York: Harper and Row, 1964.

- Kecskemeti, Paul. Strategic Surrender. Stanford: Stanford University Press, 1958.
- Kennan, George F. Realities of American Foreign Policy. Princeton: Princeton University Press, 1954.
- Kintner, W.R., and Reinhardt, G.C. Atomic Weapons in Land Combat. Harrisburg: Military Service Publishing, 1953.
- Kintner, W.R., and Strausz-Hupé, R. A Forward Strategy for America. New York: Harper and Brothers, 1961.
- Kissinger, Henry A. Nuclear Weapons and Foreign Policy. New York: Harper and Brothers, 1957.
- _____. ed. Problems of Nuclear Strategy. New York: Praeger Publishers, 1965.
- _____. The Troubled Partnership: A Reappraisal of the Atlantic Alliance. New York: McGraw-Hill, 1965.
- Knorr, Klaus, ed. NATO and American Security. Princeton: Princeton University Press, 1959.
- _____. On the Uses of Military Power in the Nuclear Age. Princeton: Princeton University Press, 1966.
- _____, and Read, Thorton, ed. Limited Strategic War. New York: Praeger Publishers, 1962.
- Leebaert, Derek, ed. Soviet Military Thinking. Boston: George Allen and Unwin, 1981.
- Le Ghait, Edouard. No Carte Blanche to Capricorn: The Folly of Nuclear War Strategy. New York: Bookfield House, 1960.
- LeMay, Curtis E. America is in Danger. New York: Funk and Wagnalls, 1968.
- Lowe, George E. The Age of Deterrence. Boston: Little, Brown and Co., 1964.
- McNamara, Robert. The Essence of Security. London: Hodder and Stoughton, 1968.
- Mandelbaum, Michael. The Nuclear Question: The United States and Nuclear Weapons, 1946-1976. Cambridge: Cambridge University Press, 1979.
- _____. The Nuclear Revolution. Cambridge: Cambridge University Press, 1981.
- _____. The Nuclear Future. Ithaca: Cornell University Press, 1983.

- Martin, Laurence, ed. Strategic Thought in the Nuclear Age. Baltimore: Johns Hopkins University Press, 1979.
- Mataxis, T.C., and Goldberg, S.L. Nuclear Tactics, Weapons and Firepower in the Pentomic Division, Battle Group, and Company. Harrisburg: Military Service Publishing Co., 1959.
- Mearsheimer, John. Conventional Deterrence. Ithaca: Cornell University Press, 1983.
- Middleton, Drew. The Atlantic Community: A Study in Unity and Disunity. New York: David McKay Co., 1965.
- Myers, Kenneth, ed. NATO: The Next Thirty Years. Boulder: Westview Press, 1980.
- Nerlich, Uwe, ed. Soviet Power and Western Negotiating Policies. Vol. 1: The Soviet Asset: Military Power in the Competition Over Europe. Cambridge: Ballinger Publishing, 1983.
- _____, and Holst, Johan J., ed. Beyond Deterrence: New Aims, New Arms. New York: Crane, Russak and Co., 1977.
- Newhouse, John. U.S. Troops in Europe: Issues, Costs and Choices. Washington, D.C.: Brookings Institution, 1971.
- O'Brien, William. The Conduct of Just and Limited War. New York: Praeger Publishers, 1981.
- Olive, Marsha M., and Porro, J., ed. Nuclear Weapons in Europe: Modernization and Limitation. Lexington: Lexington Books, 1983.
- Osgood, Robert. Limited War: The Challenge to American Strategy. Chicago: University of Chicago Press, 1957.
- _____. NATO: The Entangling Alliance. Chicago: University of Chicago Press, 1962.
- _____. Limited War Revisited. Boulder: Westview Press, 1979.
- Peeters, Paul. Massive Retaliation: The Policy and Its Critics. Chicago: Henry Regnery Co., 1959.
- Pfaltzgraff, R.L., and Davis, J.K. "Soviet Theatre Strategy: Implications for NATO." USSI Report 78-1. Washington, D.C.: United States Strategic Institute, 1978.

- Pranger, Robert, and Labrie, Roger, ed. Nuclear Strategy and National Security: Points of View. Washington, D.C.: American Enterprise Institute for Public Policy Research, 1977.
- Record, Jeffrey. U.S. Nuclear Weapons in Europe: Issues and Alternatives. Washington, D.C.: Brookings Institute, 1974.
- Reinhardt, Klaus. American Strategy in the Nuclear Age. Norman: University of Oklahoma Press, 1955.
- Report of the European Security Study: Strengthening Conventional Deterrence in Europe. By Robert Bowie, Chairman. New York: St. Martin's Press, 1983.
- Rose, John. The Evolution of U.S. Army Nuclear Doctrine, 1945-1980. Boulder: Westview Press, 1980.
- Rosecrance, Richard. "Strategic Deterrence Reconsidered." Adelphi Paper 116. London: International Institute for Strategic Studies, 1975.
- Scheer, Robert. With Enough Shovels: Reagan, Bush and Nuclear War. New York: Random House, 1982.
- Schelling, Thomas. The Strategy of Conflict. Cambridge: Harvard University Press, 1960.
- _____. Arms and Influence. New Haven: Yale University Press, 1966.
- Schmidt, Helmut. Defense or Retaliation: A German View. Translated by Edward Thomas. New York: Praeger Publishers, 1962.
- _____. The Balance of Power: Germany's Peace Policy and the Superpowers. Translated by Edward Obe. London: William Kimber, 1971.
- Segal, Gerald; Bayliss, John; Freedman, Lawrence; and Moreton, Edwina. Nuclear War and Nuclear Peace. New York: St. Martin's Press, 1983.
- Sloss, Leon. "NATO Reform: Prospects and Priorities." The Washington Papers III, No. 30. Beverly Hills: Sage Publications, 1975.
- Snyder, Glenn. Deterrence and Defense: Toward a Theory of National Security. Princeton: Princeton University Press, 1961.
- Speed, Roger. Strategic Deterrence in the 1980's. Stanford: Hoover Institution Press, 1979.

- Steel, Ronald. The End of Alliance. New York: Viking Press, 1962.
- Strachey, John. On the Prevention of War. New York: St. Martin's Press, 1962.
- Suvorov, Victor. Inside the Soviet Army. New York: Macmillan Publishing, 1982.
- Talbott, Strobe. Endgame: The Inside Story of SALT II. New York: Harper and Row, 1979.
- Taylor, Maxwell. The Uncertain Trumpet. New York: Harper and Brothers, 1959.
- Thompson, W. Scott, ed. National Security in the 1980's: From Weakness to Strength. San Francisco: Institute for Contemporary Studies, 1980.
- Treverton, G. "Nuclear Weapons in Europe." Adelphi Paper 168. London: International Institute for Strategic Studies, 1981.
- Twining, Nathan. Neither Liberty Nor Safety: A Hard Look at U.S. Military Policy and Strategy. New York: Holt, Rinehart and Winston, 1966.
- Vance, Cyrus. Hard Choices: Critical Year in America's Foreign Policy. New York: Simon and Schuster, 1983.
- Wolfe, Thomas W. Soviet Strategy at the Crossroads. Cambridge: Harvard University Press, 1964.
- _____. Soviet Power and Europe, 1945-1970. Baltimore: Johns Hopkins University Press, 1970.
- Yost, David S. "European Security and the SALT Process." The Washington Papers IX, No. 85. Beverly Hills: Sage Publications, 1981.
- _____, ed. NATO's Strategic Options: Arms Control and Defense. New York: Pergamon Press, 1981.

ARTICLES AND MAGAZINES

- Allen, C.F. "Dispersed--Yet Organized." Military Review (July 1950): 24-30.
- Amme, C.H. "NATO Strategy and Flexible Response." United States Naval Institute Proceedings (May 1967): 59-69.

- Amme, C.H. "The Soldier and THE BOMB." Army 19, No. 9 (September 1967): 29-37.
- Angioni, Franco. "Ground Forces in Future Warfare." Military Review (October 1961): 47-55.
- Armstrong, Alan. "Nuclear Weapons and NATO." Military Review (May 1980): 11-17.
- Barclay, C.N. "Atomic Warfare: Some Ideas on Possible Future Developments." Brassey's Annual (1952): 59-70.
- Beumont, H.C. "Missile Division." Army 8, No. 11 (June 1958): 49-52.
- Beecher, W. "Over the Threshold: Clean Tactical Nuclear Weapons For Europe." Army 22, No. 7 (July 1972): 17-20.
- Bertram, Christoph. "The Implications of Theatre Nuclear Weapons in Europe." Foreign Affairs 60, No. 2 (Winter 1981/1982): 305-326.
- Bidwell, S. "The Use of Small Nuclear Weapons in War on Land." Army Quarterly 101, No. 3 (1971): 295-306.
- Birrer, Ivan. "U.S. Army: Command and General Staff College, 1956-1966." Military Review (May 1966): 3-13.
- Bracken, Paul. "The NATO Defense Problem." Orbis 27, No. 1 (Spring 1983): 83-106.
- Brodie, Bernard. "Nuclear Weapons: Strategic or Tactical?" Foreign Affairs 32 (January 1954): 217-229.
- Brogan, M.F. "Tactics and Atomics." Military Review (October 1961): 90-96.
- Brown, William D. "Whatever Happened to Tactical Nuclear Warfare?" Military Review (January 1980): 46-53.
- Bull, Hedley. "European Self-Reliance and the Reform of NATO." Foreign Affairs 61, No. 4 (Spring 1983): 874-892.
- Canby, Steven. "NATO Military Policy: Obtaining Conventional Comparability With the Warsaw Pact." Rand R-1088-ARPA. Santa Monica: Rand Corporation, 1973.
 _____; Karber, P.; Wilcox, J.; and Cabaniss, E.
 "Symposium of Military Strategy in Western Europe." Armed Forces and Society 7, No. 1 (Fall 1980).

- Cohen, S.T. "Tactical Nuclear Weapons and U.S. Military Strategy." Orbis XV, No. 1 (Spring 1971): 178-193.
- _____, and Lyons, W.C. "A Comparison of U.S.-Allied and Soviet Tactical Nuclear Force Capabilities and Policies." Orbis XIX, No. 1 (Spring 1975): 72-92.
- Collins, A.S. "Tactical Nuclear Warfare and NATO: Viable Strategy or Dead End?" NATO's Fifteen Nations (June/July 1976): 73-87.
- Cordesman, Anthony. "Offsetting the Continuing Downward Trend in NATO Conventional Capabilities." Armed Forces Journal International (June 1981): 56, 108-109.
- _____. "Nuclear Forces Under Reagan: The Strategy of Inadvertence." Armed Forces Journal International (October 1981): 30-32.
- _____. "The NATO Central Region and the Balance of Uncertainty." Armed Forces Journal International (July 1983): 18-58.
- Cushman, John H. "Pentomic Infantry Division in Combat." Military Review (January 1958): 19-30.
- Dean, Jonathan. "Beyond First Use." Foreign Policy, No. 48 (Fall 1982): 37-53.
- DePuy, W.E. "The Case for a Dual Capability." Army 10, No. 6 (January 1960): 32-40.
- De Rose, Francois. "Atlantic Relationships and Nuclear Problems." Foreign Affairs 41, No. 3 (April 1963): 479-490.
- _____. "Updating Deterrence in Europe: Inflexible Response?" Survival XXIV, No. 1 (January/February 1982): 19-23.
- _____. "Inflexible Response." Foreign Affairs 61, No. 1 (Fall 1982): 136-150.
- De Weerd, H.A. "Is It Time U.S. Reappraised Its Nuclear Weapons Policies?" Army (January 1977): 15-19.
- Downey, Edward. "Nuclear War--Why We Should Win." Military Review (August 1960): 44-49.
- Dupuy, T.N. "Can America Fight a Limited Nuclear War?" Orbis 5, No. 1 (Spring 1961): 31-42.
- _____. "Tactical Nuclear Combat." Ordnance, No. 291 (November/December 1968): 292-296.
- Eddleman, C.D. "Men, Missiles and Atomics on the Future Army Battlefield." Army 7, No. 5 (December 1956): 24-30.

- Edmond, Emil. "Nuclear Firepower and the Maneuver Force." Military Review (April 1961): 60-63.
- Ellis, Ronan. "Beyond Deterrence: A Rational Approach to the Deployment of Tactical Nuclear Weapons in Europe." In Tactical Nuclear Operations, RB 101-31, pp. 9-1 to 9-8. Edited by the U.S. Army Command and General Staff College. Fort Leavenworth: USACGSC, 1980.
- Faire, S. "A Tactical Nuclear Strategy for NATO." NATO's Fifteen Nations (April/May 1974): 59-60.
- Freedman, Lawrence. "The Dilemma of Theatre Nuclear Arms Control." Survival XXIII, No. 1 (January/February 1981): 2-10.
- _____. "NATO Myths." Foreign Policy, No. 45 (Winter 1981/1982): 48-68.
- Friedberg, Aaron. "A History of the U.S. Strategic Doctrine, 1945 to 1980." Journal of Strategic Studies III, No. 3 (December 1980): 37-71.
- Frye, Alton. "Nuclear Weapons in Europe: No Exit From Ambivalence." Survival XXII, No. 3 (May/June 1980): 98-106.
- Garthoff, Raymond. "Brezhnev's Opening: The TNF Tangle." Foreign Policy, No. 41 (Winter 1980/1981): 82-94.
- _____. "The NATO Decision on Theatre Nuclear Forces." Political Science Quarterly 98, No. 2 (Summer 1983): 197-214.
- Gavin, James M. "The Tactical Use of the Atomic Bomb." U.S. Army Combined Forces Journal 1, No. 4 (November 1950): 9-11.
- Geneste, Marc. "Is There a Way Out of the Stalemate?" Military Review (July 1962): 2-7.
- _____. "A Common Western Nuclear Doctrine." Military Review (September 1971): 3-12.
- _____. "The City Walls: A Credible Defense Doctrine for the West." Orbis XIX, No. 2 (Summer 1975): 477-496.
- _____. "European Land Defense." Comparative Strategy, No. 3 (November 1980): 239-247.
- Gray, Colin. "Theatre Nuclear Weapons: Doctrines and Postures." World Politics, No. 2 (January 1976): 300-314.
- _____. "NATO Strategy and the Neutron Bomb." Policy Review, No. 7 (Winter 1979): 7-27.

- Hadley, A.T. "Low-Yield Atomic Weapons: A New Military Dimension." The Reporter 14, No. 8 April 1956): 23-25.
- Hoag, M.W. "NATO: Deterrent or Shield?" Foreign Affairs 36, No. 2 January 1958): 1-15.
_____. "The Place of Limited War in NATO Strategy." Rand P-1566. Santa Monica: Rand Corporation, 1958.
- Hoffman, Stanley. "NATO and Nuclear Weapons: Reason and Unreason." Foreign Affairs 60, No. 2 (Winter 1981/1982): 327-346.
- Howze, H.H. "The Land Battle in an Atomic War." Army 11, No. 12 (July 1961): 29-36.
- Hughes, G. Philip. "Cutting the Gordian Knot: A Theatre Nuclear Force for Deterrence in Europe." Orbis 22, No. 2 (Summer 1978): 309-332.
- Kaiser, Karl; Leber, G.; Mertes, A.; and Schulze, Franz-Josef. "Nuclear Weapons and the Preservation of Peace." Foreign Affairs 60, No. 5 (Summer 1982): 1157-1170.
- Karber, P.A. "Nuclear Weapons and Flexible Response." Orbis 14, No. 2 (Summer 1970): 284-297.
- Kennan, George; Bundy, McGeorge; McNamara, Robert; and Smith, Gerard. "Nuclear Weapons and the Atlantic Alliance." Foreign Affairs 60, No. 4 (Spring 1982): 753-768.
- Kintner, W.R., and Possony, Stefan. "NATO's Nuclear Crisis." Orbis 6, No. 2 (Summer 1962): 217-243.
- Kissinger, Henry. "Missiles and the Western Alliance." Foreign Affairs (April 1958): 383-400.
_____. "Limited War: Conventional or Nuclear?" Daedalus (Fall 1960): 800-817.
- Kohanson, S.C. "Pentomic Counterfire Methods." Army 8, No. 8 (March 1958): 40-41.
- Komer, Robert. "The Rejuvenation of the Seventh Army." Armed Forces Journal International (May 1983): 54-59.
- Le Cheminant, P. "Tactical Deterrence or Limited War?" Brassey's Annual (1961): 112-121.
- Lemnitzer, L.L. "Forward Strategy Reappraised." Army 11, No. 2 (September 1960): 41-43.

- Levine, R.; Connors, T.T.; Weiner, M.G.; and Wise, R.A.
 "A Survey of NATO Defense Concepts." Rand N-1871-AF.
 Santa Monica: Rand Corporation, 1982.
- Lewis, Kevin. "Nuclear Weapons Policy, Planning and War Objectives: Toward a Theatre-Oriented Deterrent Strategy." Rand P-6764. Santa Monica: Rand Corporation, 1982.
- McHaney, G.M. "What is Tactical Use of Nuclear Weapons?" Army 13, No. 9 (April 1963): 40-47.
- McNamara, Robert. "The Military Role of Nuclear Weapons." Foreign Affairs 62, No. 1 (Fall 1983): 59-80.
- Makins, Christopher. "TNF Modernization and Countervailing Strategy." Survival XXIII, No. 4 (July/August 1981): 157-164.
- Mattimoe, C.M. "Atomic War Tactics." Military Review (February 1957): 88-94.
- Maurer, John, and McCormick, Gordon. "Surprise Attack and Conventional Defense in Europe." Orbis 27, No. 1 (Spring 1983): 107-126.
- Menaul, Stewart. "The Role of Theatre Nuclear Weapons." Comparative Strategy 4, No. 1 (1983): 21-29.
- Mendershausen, Horst. "The Defense of Germany and the German Defense Contribution." Rand P-6686. Santa Monica: Rand Corporation, 1981.
- Miksche, F.O. "The European Shield: Are Atomic Weapons the Most Ideal?" NATO's Fifteen Nations 7, No. 4 (August/September 1962): 15-22.
- Miller, M.J. "Soviet Nuclear Tactics." Ordnance, No. 300 (May/June 1970): 624-627.
- Millet, S.M. "Forward-Based Nuclear Weapons and SALT I." Political Science Quarterly 98, No. 1 (Spring 1983): 79-97.
- Murphy, Charles. "NATO at a Nuclear Crossroads." Fortune 66, No. 6 (December 1962): 85-87.
- Nickerson, H. "Atomic Military Theory." Journal of Royal Artillery 73, No. 3 (July 1946): 218-224.
- Oldfield, B. "The Lance--Shoot and Scoot." NATO's Fifteen Nations (April/May 1975): 78-81.

- Panofski, Wolfgang, and Keeny, S. "MAD Versus NUTS: The Mutual Hostage Relationship of the Superpowers." Foreign Affairs 60, No. 2 (Winter 1981/1982): 287-304.
- Peal, C.D.M. "Nuclear Fire Planning at the Divisional Level." Journal of the Royal Artillery 86, No. 3 (Winter 1959): 173-175.
- Polk, J.H. "The Realities of Tactical Nuclear Warfare." Orbis 17, No. 2 (Summer 1973): 4.
- Read, T. "Nuclear Tactics for Defending a Border." World Politics 15, No. 3 (April 1963): 390-402.
- Record, J. "To Nuke or not to Nuke: A Critique of Rationales for a Tactical Nuclear Defense of Europe." Military Review (October 1974): 3-13.
- Reinhardt, Klaus. "Problems of Employing Nuclear Weapons Considering the Special Situation of the Federal Republic of Germany." In Tactical Nuclear Operations RB 101-31, pp. 7-1 to 7-23. Edited by the U.S. Army Command and General Staff College. Fort Leavenworth: USACGSC, 1980.
- _____, and Kintner, W.R. "The Tactical Side of Atomic Warfare." Bulletin of Atomic Scientists 11, No. 2 (February 1955): 53-58.
- Rogers, Bernard, General. "The Atlantic Alliance: Prescriptions for a Difficult Decade." Foreign Affairs 60, No. 5 (Summer 1982): 1145-1156.
- _____. "Greater Flexibility for NATO's Flexible Response." Strategic Review XI, No. 2 (Spring 1983): 11-19.
- Rose, John. "U.S. Army Doctrine and the Nuclear Threat." In NATO's Strategy Options: Arms Control and Defense, pp. 27-45. Edited by David Yost. New York: Pergamon Press, 1981.
- Rosenberg, David A. "The Origins of Overkill: Nuclear Weapons and American Strategy, 1945-1960." International Security 7, No. 4 (Spring 1983): 3-71.
- Rowny, E.L. "Ground Tactics in an Atomic War." Army Combat Forces Journal (August 1954): 18-22.
- Russett, Bruce, and DeLuca, Donald. "Theatre Nuclear Forces: Public Opinion in Western Europe." Political Science Quarterly 98, No. 2 (Summer 1983): 179-196.

- Sakharov, A. "The Danger of Thermonuclear War." Foreign Affairs 61, No. 5 (Summer 1983): 1001-1016.
- Schemmer, Benjamin. "NATO's New Strategy: Defend Forward, But Strike Deep." Armed Forces Journal International (November 1982): 50-68.
- Shishko, Robert. "The European Conventional Balance: A Primer." Rand P-6707. Santa Monica: Rand Corporation, 1981.
- Shreffler, R.E. "A Credible Nuclear Emphasis Defense for NATO." Orbis 17, No. 2 (Summer 1973): 463-479.
_____, and Bennett, W.S. "Tactical Nuclear Warfare." Los Alamos LA-4467-MS. Los Alamos: Los Alamos Laboratory, 1970.
- Sinnreich, R.H. "NATO's Doctrinal Dilemma." Orbis XIX, No. 2 (Summer 1975): 461-476.
- Stanley, T.W. "Decentralizing Nuclear Control in NATO." Orbis 7, No. 1 (Spring 1963): 41-48.
- Thompson, James, ed. "NATO: Agenda for the Next Four Years." Rand R-2836-FF. Santa Monica: Rand Corporation, 1982.
- Trettner, H. "Tactical Nuclear Weapons for Europe." Military Review (July 1971): 43-49.
- Treverton, G. "Managing NATO's Nuclear Dilemma." International Security 7, No. 4 (Spring 1983): 93-115.
- Ullman, Richard. "Out of the Euromissile Mire." Foreign Policy, No. 50 (Spring 1983): 39-52.
- Van Veen, E. "Theatre Air Forces and Tactical Nuclear Weapons." NATO's Fifteen Nations (August/September 1972): 35-41.
- Von Schweppenburg, G. "Atomic Weapons and Armor." Military Review (November 1956): 100-102.
- Wagstaff, Jack J. "The Army's Preparation for Atomic Warfare." Military Review (May 1955): 3-6.
- Walker, R.M. "The Night Attack Blueprint for Atomic Victory." Military Review (October 1957): 52-56.
- Warshawsky, Arnold S. "Radiation Battlefield Casualties--Credible." Military Review (May 1976): 3-10.

- Watkins, H.S.C. "Atomic Weapons in the Land Battle."
Brassey's Annual (1958): 177-184.
- Wilkinson, P.J. "Tactical Atomic Support of Ground Forces."
Military Review (August 1954): 102-109.
- Wisner, Kent. "Military Aspects of Enhanced Radiation
Weapons." Survival XXIII, No. 6 (November/December
1981): 245-251.
- Wohlstetter, Albert. "The Delicate Balance of Terror."
Foreign Affairs XXXVII (January 1959): 211-234.
- Wyman, W.G. "The U.S. Army: Its Doctrine and Influence on
U.S. Military Strategy." Military Review (March 1958):
3-13.

GOVERNMENT PUBLICATIONS

- U.S., Congress, Senate. Armed Services Committee. NATO and
the New Soviet Threat, report by Senators Sam Nunn and
Dewey Bartlett, 95th Cong., 1st sess., 1977.
- U.S., Congress, Senate. Armed Services Committee, Subcom-
mittee on Manpower and Personnel. Hearing on NATO
Posture and Initiatives. 95th Cong., 1st sess., 1977.
- U.S., Congress, Senate. Committee on the Armed Services.
Inquiry into Satellite and Missile Programs, Hearings
Before the Senate Committee on the Armed Services,
85th Cong., 2nd sess., 1957-1958.
- U.S., Congress, House. Committee on Foreign Affairs. U.S.
Forces in NATO, Hearings Before the House Committee
on Foreign Affairs, 93rd Cong., 1st sess., 1973.
- U.S., Congress, Senate. Committee on Foreign Relations.
U.S. Forces in Europe, Hearings Before the Senate
Subcommittee on Arms Control, International Law and
Organization, 93rd Cong., 1st sess., 1973.
- U.S., Congress, Senate. Committee on Foreign Relations.
U.S. Security Issues in Europe: Burden Sharing and
Offset, MBFR, and Nuclear Weapons, A Staff Report
for the Subcommittee on U.S. Security Agreements and
Commitments Abroad, 93rd Cong., 1st sess., 1973.
- U.S., Congress, Senate. Committee on Government Operations.
The Atlantic Alliance, Hearings Before the Senate
Committee on Government Operations, Part II, 89th
Cong., 1966.

- U.S., Congress, House. Committee on International Relations. First Use of Nuclear Weapons: Preserving Responsible Control, Hearings Before the Subcommittee on International Security and Scientific Affairs, 94th Cong., 2nd sess., 1976.
- U.S., Congress, Senate, House. Joint Committee on Atomic Energy. Military Applications of Nuclear Technology, Hearings Before the Subcommittee on Military Applications, 93rd Cong., 1st sess., 1973.
- U.S., Congress, Senate, House. Joint Committee on Atomic Energy. The American Commitment to NATO, Report of the Special Subcommittee on North Atlantic Treaty Organization Commitments, 93rd Cong., 1st sess., 1972.
- U.S., Congress, Senate. North Atlantic Assembly's Special Committee on Nuclear Weapons in Europe. Second Interim Report on Nuclear Weapons in Europe, Report to the Committee on Foreign Relations, 98th Cong., 1st sess., 1983.
- U.S., Congress, Senate. Preparedness Investigating Subcommittee of the Committee on the Armed Services and Committee on Aeronautical and Space Sciences. Joint Hearings on Missile and Space Activities, 86th Cong., 1st sess., 1959.
- U.S., Department of the Army. FM-5-26, "Employment of Atomic Demolition Munitions," 1965.
- _____. FM 6-20, "Fire Support in Combined Arms Operations," 1977.
- _____. FM 61-100, "The Division," 1962.
- _____. FM 61-100, "The Division," 1968.
- _____. FM 100-5, "Operations," 1968.
- _____. FM 100-5, "Operations," 1976.
- _____. FM 100-5, "Operations," 1982.
- _____. FM 100-30, "Tactical Nuclear Operations (TEST)," 1971.
- _____. FM 100-31, "Tactical Use of Atomic Weapons," 1951.
- _____. FM 101-31-1, "Nuclear Weapons Employment Doctrine and Procedures," 1977.
- U.S., Department of Defense. Annual Report FY 19XX. Washington, D.C.: Government Printing Office, 19XX.
- U.S., Department of State. Bulletin. Washington, D.C.: Government Printing Office, 19XX.

U.S., Department of State. Bureau of Public Affairs.
SALT II-Vienna 18 June 1979, Selected Documents 12A.
Washington, D.C.: Government Printing Office, 1979.

White Paper 1975/1976: The Security of the Federal Re-
public of Germany and the Development of the Federal
Armed Forces. Bonn: Press and Information Office of
the Federal Republic of Germany, 1976.

White Paper on Defense: The Security of Italy and the Pro-
blems of the Italian Armed Forces. Italian Ministry
of Defense, 1977.

OTHER SOURCES

Christian Science Monitor	Newsweek
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